THE ENGINEERING AND MINING JOURNAL

COAL

Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. L. JULY 12. No. 2.

RICHARD P. ROTHWELL, C.E, M.E., Editor.

ROSSITER W. RAYMOND, Ph.D., M.E. Special Contributor.

Cable Address: "Rothwell, New York." Use A. B. C. Code, Fourth Edition

London: 76 Finsbury Pavement, London, E. C., Mr. Thomas B. Provis, Civ and Mining Engineer, Manager.
Mexico: Mr. R. E. Chism, M. E., Callejon Espirito Santo No. 4, City of Mexico.
Peru, S. A.: Mr. John Newton, No. 2 Calle Constitucion, Calla.
Australasia: Messrs. Moffat, Judd & Co., 11 Bridge street, Sydney, N. S. W.; Mr. W. Forster, 56 Elizabeth street, Melbourne, Victoria; Messrs. J. T. Partridge & Co., 134 Manchester street, Christchurch, New Zealand.

SUBSCRIPTION PRICE, including postage:
Weekly Edition (which includes the Export Edition), for the United States, Mexico and Canada, $4 per annum; $2.25 for six months; all other countries in the Postal Union, $5.
Monthly Export Edition, all countries, $2.50 gold value per annum.
REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO. All payments must be made in advance.

THE SCIENTIFIC PUBLISHING CO., Publishers,

SOPHIA BRAEUNLICH, Sec'y & Treas. R. P. ROTHWELL. Pres. and Gen'l Manager.
P.O. Box 1833. 27 Park Place, New York.

CONTENTS.

	PAGE.
The 141st Meridian	41
Persian Mineral Resources	41
The Compromise Silver Bill	41
Railroad Tonnage, Costs and Rates	41
Railroad Land Grants and Mineral Lands	41
The Profits from Coal Mining in Great Britain	41
Perpetual Motion Outdone	41
The Long-Suffering Comstock Shareholders	42
Trades-Unionism in the Professions	42
The Thermo-Electric Measurement of High Temperatures	43
Fossil Wood and Lignite of the Poto, mac Formation	43
Work Done in the Division of Chemistry and Physics in 1886-87	43
Midnight Talks at the Club	43
Annual Report of the State Geologist of New Jersey, 1889	43
Pavements and Roads	43
Books Received	43
The Cook Amalgamator	44
Attenuated Scientific Deductions	44
*Darby's Recarburizing Process	44
Notes on Alloys	45
Pneumatic Gun Trial	46
Compound Locomotives in Germany	46
The Compromise Silver Bill	46
Coal in the South of England	46
*Pick's System of Manufacturing Salt in Vacuo	46
A New Form of Coal Washing Machine	48
Gems and Precious Stones	48
*Automatic Apparatus for Controlling Bessemer Convertors	48
Zinc and Lead in Burnt Gases from Blast Furnaces	49
American Association for the Advancement of Science	49
*Repairing the Arch of the Musconetcong Tunnel	50
*Improvements in the Treatment of Alkali Waste	50
The Mineral Output Abroad	51
Seeing by Electricity	51
Aboriginal Carpentry	51
Premiums for Inventors	51
French Enterprise in Chili	51
New War Ships	51
An Aid in Coke Drawing	51
Belgian Metallurgical Industry	52
International Congress on Inland Navigation	52
New York State Labor Statistics	52
American-Built Cars for Europe	52
Miners' Wages on the Continent	52
Electric Drills at the Brooklyn Navy Yard	52
Electric Power vs. Steam Power for Small Plants	52
Dry Air Refrigerating Apparatus Without Machinery	52
Personals, Obituary	53
Industrial Notes	53
Contracting Notes	53
Machinery and Supplies Wanted at Home and Abroad	53

MINING NEWS:		East India	57	MINING STOCK TABLES:	
Alabama	54	Malay Peninsula	57	Baltimore	66
Arizona	54	Nova Scotia	58	Birmingham	66
California	54	MEETINGS	58	Boston	65
Colorado	54	DIVIDENDS	58	Coal Stocks	65
Georgia	55	ASSESSMENTS	58	London	66
Missouri	55			New York	65
Montana	55	MINING STOCK MARKETS:		Pittsburg	66
Nevada	55			Paris	66
South Carolina	55	New York	58	San Francisco	65
Ohio	56	Boston	58	St. Louis	66
Pennsylvania	56	Salt Lake	58	Trust Stocks	66
Virginia	56	St. Louis	58		
West Virginia	56	Denver	59	MARKETS:	
		Kansas City	59	COAL:	
FOREIGN:		Minneapolis	59	New York	59
		Lake Superior Gold and Iron Stocks	59	Boston	60
British Columbia	56			Buffalo	60
Canada	57	Pipe Line	59	Chicago	60
Central America	57			Pittsburg	60

FREIGHTS	60
METALS	60
IRON:	
New York	61
Chicago	61
Louisville	62
Philadelphia	62
Pittsburg	62
IMPORTS AND EXPORTS	63
CHEMICALS AND MINERALS	62
BUILDING MATERIAL MARKET	63
CURRENT PRICES:	
Chemicals	66
Minerals	66
Rarer Metals	66
Building Mat'r.	66
ADV. INDEX	xxi

AN extraordinary report comes from Fort Chippeweyan that the United States surveyors have established the 141st meridian, which forms the boundary between Alaska and Canada, twenty-eight miles farther east than it was supposed to be. If this is true, a large area of gold placer ground would be transferred to the United States. But it seems strange that so great an error should have been allowed to pass in a region which was well known to traders and prospectors.

PERSIAN mineral resources have been attracting much attention of late, mainly on the strength of reports made by General SCHINDLER, who acts as Inspector-General of mines for the Imperial Bank. Very important and conveniently located coal and iron deposits are said to exist in Persia, and there is a prospect that these will be developed in the near future. The policy of Persia is becoming more progressive, and the aid of foreign engineers and capitalists would now be welcomed there. It will be remembered that two years ago a small breeze was started in this country by a semi-official call for American engineers. The indications are that there may be a new field for their services before long.

WE publish in another column the text of the report of the Conference Committee, constituting the compromise silver bill now accepted by the Senate. There is apparently no doubt of its approval by the House, and it is not sufficiently at variance with the views of the Secretary of the Treasury to warrant a veto by the President. We shall discuss the matter more fully in another issue. The market evidently looks upon the matter as a foregone conclusion, as the price for silver bullion has, at the time of writing, reached 106¾. It is interesting to note the increasing accumulation of silver held for the rise expected to follow the signing of the bill. The amount represented by silver certificates is 6,472,000 ounces. We know of about 1,500,000 more held by two banks in this city, and we learn on reliable authority that there are about 2,000,000 held in London on New York account, or a total of about 10,000,000 ounces.

THE *Railway Review* prints a curious diagrammatic representation of the theoretical relation between railroad tonnage, costs, and rates. It is in the shape of an equilateral triangle, and the three sides are marked: (1) "The tonnage will depend upon the rate;" (2) "the rate will depend upon the cost;" (3) "the cost will depend upon the tonnage." Thus, beginning the computation on either datum, and extending it in either direction, a return to the starting point is inevitable. This is all very pretty; but, as the *Review* sensibly points out, "a reasonable rate on the basis of cost, and a fixed percentage of profit, is a beautiful idea, perhaps, but can never be accomplished. As well might a farmer attempt to determine, when his apple trees bloom, at what price per barrel he must sell his prospective crop in order to realize a fair return from his investment as for any one, even though he be a legislator, to establish a reasonable rate on the basis of cost, and a fixed percentage of profit. It cannot be done.'

UNCERTAINTY still exists as to the final issue of the question now pending between some of the land-grant railroad companies and the owners of mining claims situated on the lands claimed by the roads. When Congress in 1864 passed the acts making grants to the Northern Pacific and other roads, the right to mineral locations was expressly reserved. But the Northern Pacific contends that this reservation applies only to land known at the time to be mineral-bearing, and this view was taken in a decision by Judge SAWYER in the United States Circuit Court for California in December last. There is said to be a probability that this decision may be sustained by the Supreme Court. Naturally much feeling has been aroused among the mining men who are concerned. A large number of locations, some of which are patented, of gold, silver and copper are involved in Montana, where the Northern Pacific claims 2,800,000 acres. In California the Northern Central and Southern Pacific roads have similar claims to lands, a portion of which is mineral-bearing. The Secretary of the Interior, in his last annual report, recommended that provision should be made to secure mine owners in their titles. The equities are certainly with the miners, but the interpretation of the grant acts is another matter. It is to be hoped that a satisfactory solution may be reached.

THE profits from mining coal in Great Britain are much less than is generally supposed. No very recent statistics are available, but in 1887 a committee appointed by the united stock companies to examine into the matter made a report upon the operations of 23 companies, which brought out some remarkable results. We do not know how far the committee was biased by a policy of making a poor showing as an argument against the persistent demands of the miners for higher wages, but the figures as they stand are instructive.

In ten years the average yearly dividends were only 2·67 per cent. on the invested capital; and of the 23 companies only five paid dividends regularly during that time, their average being 5½ per cent. and that of the other 18 companies about one per cent. In 117 cases the books showed a profit, while in 115 cases the balance was on the wrong side. But this is not all. The London *Mining Journal* now goes further and remarks that "if the liabilities had been taken into consideration as well as the sums that should have been written off, then the whole of these companies would have shown no gain at all." Evidently, if this is the state of things at the present time, there is not only no prospect of any great betterment of the condition of English coal miners, but also a gloomy outlook for the colliery owners in competition with Continental mines.

PERPETUAL MOTION OUTDONE.

Here is an account of an invention which the New Orleans *Times-Democrat* innocently says "dwarfs all others of recent years." It does, most decidedly, if the reporter may be trusted. This is how he describes it:

Machinery for generating steam by electricity has been set up here and jealously guarded, but a reporter managed to get into the room in which the plant is located and guarded, and this is what he found:

'To a battery of two 20 horse tubular boilers, a 10 horse engine and boiler is temporarily connected to heat the water in them; steam is first raised in the small boiler, and a dynamo used to produce electricity. The flues in the large boiler are filled with

asbestos, the ends are connected with the dynamo, and the passage of the electricity through the asbestos heats it to an intense degree, causing a rapid rising of steam. When the required pressure in the large boilers has been attained, the engine driving the dynamo is attached to the large boiler, and the work goes on as before.

In this way it is claimed that but 25 per cent. of the power of the large boilers will be required to furnish 40 horse power, leaving three-fourths of the power to be applied to other purposes. It is claimed that the power can be supplied in this manner to any required amount. The 40 horse power could be used after starting to start up a 160 horse power and keep it moving without any cost whatever outside of keeping up the machinery. This is the first instance on record where power could be increased; nature has always worked the other way and demanded that a stronger should work the weaker, as the 40 horse power to drive 10, and if this proves a success, as is claimed, the company have the biggest discovery ever made in America that will rank next to the discovery of steam power itself.

Perpetual motion would be an accomplished fact if a machine could be constructed that would maintain a visible movement without application of external energy after once being started. It would not be required that any useful effect should ensue. But in this invention, which dwarfs all others of recent years, we have something far beyond the wildest dream of the perpetual motion fiend. All you have to do is to fire up a little boiler, with the power generated in it make steam thermo-electrically in bigger boilers, reserve a part of their power for supplying another set of boilers with steam, and so on indefinitely, at each stage gaining power on a fixed initial fuel consumption, and utilizing most of it. As the *Times-Democrat* neatly puts it: "This is the first instance on record where power could be increased; nature has always worked the other way." Truly, this is indeed an age of progress.

THE LONG-SUFFERING COMSTOCK SHAREHOLDERS.

Such a state of things as now exists, and has always existed on the Comstock since mining began there, would not be permitted, or at least would not pass without protest and opposition, in any other mining district in the country. The Comstock, however, has from the first been regarded as something exceptional in every way, and people have learned to wink at palpable offenses against business morality if connected with the Comstock mines, which would arouse the greatest indignation and would lead to active efforts for redress if practised elsewhere. This feeling is almost beyond the understanding of those who have not been brought into personal contact with it, but it exists, and flourishes now almost as strongly as even in times when the great lode was in a more prosperous condition. Such long-suffering stockholders have a claim upon the sympathy, if not the admiration, of others more fortunately situated.

The reason for the apparent indifference with which gross injustice has been regarded is simple enough. Shareholders in Comstock mines, as a rule, are mostly interested only temporarily in any particular mine. They do not generally hold stocks for the sake of dividends, but for a rise. Speculation pure and simple, as contrasted with permanent investment, has prevailed, though in late years to a less extent than formerly. What difference does it make to a man holding shares for a turn whether his short-lived interest is protected or not? And it has even been argued by habitués of the San Francisco Exchanges that the very misdoings and bare-faced tricks of some of the managements tended to create a lively market and were therefore not such a bad thing after all!

The ENGINEERING AND MINING JOURNAL has frequently had occasion to call attention to the anomalous and deplorable condition of affairs on the Comstock, sometimes on one account, sometimes on another. In the issue of June 28th the discreditable mill returns were discussed. We are glad to note that the San Francisco *Mining and Scientific Press* is keeping up the agitation---not that we have a very hopeful expectation of any great practical gain to be attained by it, for Comstock peculiarities are too deeply rooted to be overturned by denunciation or, as it seems, by law. But purely as a matter of principle, it is well to protest, even if ineffectually.

It is again charged that the mill owners (who are also often mine trustees as well) enter into verbal contracts for treating ore; that they make such returns in bullion to the mines as they think proper, though the old guarantee of 65 per cent. would seem to be low enough in all conscience; that they not only claim the tailings, but also the slimes, which frequently run very high, and that the ore is neither weighed nor assayed before delivery to the mills and no intelligible report of it is made weekly to shareholders as required by law. All this is an old story and an ugly one. That it holds good now as heretofore, notwithstanding wide publicity and legislative enactments, is sufficient reason for re-telling it.

There is one way in which there is just a possibility that an improvement may be brought about. It is suggested that if the Exchanges should pass rules prohibiting brokers from selling or otherwise disposing without authority of the proxies on stock owned by their clients, and should rigidly enforce such rules, as appears practicable, then the elections of trustees of the mining companies would be fairer and officers representing the majority of shares would be secured, with benefit to the shareholders at large. As it is, it is notorious that the perfunctory voting of proxies often and even commonly results in the choice of trustees who really represent only a small minority of the shares, at times practically none. There have been instances when these annual elections have been sharply contested, but the fight between rival parties for control has generally had little interest to the mass of the shareholders. "Insiders" still act as professional trustees.

Perhaps the remedy proposed might have good results, even though imperfectly adequate. The idea is worth considering. Still, we doubt very much whether anything short of a radical revolution in public sentiment will accomplish much, and that is hardly to be looked for so long as the speculative tone remains and the Comstock *is* the Comstock.

TRADES-UNIONISM IN THE PROFESSIONS.

The *Popular Science Monthly* for July contains a vigorous protest against what it considers to be one of the most vicious forms of trades union—that which obtains in some of the learned professions. Our contemporary is especially emphatic in condemning the practice of giving to one or two medical organizations, representing certain "schools" of medicine, a quasi-legalized status on which the licensed practitioner feels authorized to condemn the unlicensed one as necessarily a quack or a crank because he holds views not in accordance with those of the recognized schools. The point is made as an illustration in the discussion of the proper functions of government, the relation of the State to the commercial welfare of the citizens (*e. g.* as in questions of protective tariffs, etc.) being the main theme of the article.

We do not altogether agree with our able contemporary. It is true that there may be individual instances of injustice in maintaining restrictions in the professions and determining arbitrarily who is and who is not competent to practise, and it may also happen that within the favored pale there may be practitioners quite as open to the epithet of quack as are some outside the fence. But in the long run, and taken as a whole, the system has probably been beneficial in protecting the public against incompetency, for the laity has little ground for an estimate of medical proficiency beyond the recognized standing which some such restrictive system may establish. At all events, if it is right for the State to interfere in any profession, it certainly is in the case of the medical; and if it is not right inherently, and in abstract justice morally, the interference may be defended as a matter of overruling policy.

In another profession, the legal, we have an example where undeniably good has been accomplished by similar restrictions. Here, besides the formal admission to practice before the courts, we find that much has been done by the censorship of bar associations in purifying the profession and elevating its tone.

In both these cases there certainly is at least room for argument in favor of a restrictive policy. And it does not detract from the working results that the animus of the privileged classes cannot but be more or less personal and selfish, whether consciously so or not.

Now, in engineering we have no such distinctions. Every man stands upon his own merits, and what these merits are can be very simply and effectively tested by the character of his work. He may or may not belong to either of the great engineering societies; and the State prescribes no "school" of practice, no arbitrary canons of orthodoxy. The three leading organizations in this country—the American Institute of Mining Engineers, the Institute of Civil Engineers and the Institute of Mechanical Engineers—and the other technical societies, have always observed a most liberal policy. They do not endorse the work of each of their members simply because of membership, and they are not unduly stringent in fixing the qualifications for admission; while on the other hand they do not disparage non-members. There are eminent engineers in each branch of the profession who belong to no technical society, and who have the respect of the profession and the confidence of the public. Of course, there are many reasons why it is extremely advantageous to engineers to be affiliated with these organizations. But it would be an unworthy motive to enter them merely for the sake of using the title of membership as an advertisement, and a poor engineer who would seek thus to establish a "character."

It may well be claimed that engineering is in this sense the most liberal of professions. It allows absolute freedom and individuality to all practitioners. There is an unwritten law prohibiting the unwarranted assumption of titles and degrees which can only be conferred by the technical institutions; but this is a point of professional ethics, and in no-wise prejudices the standing of men who have not been fortunate enough to secure such degrees. It may also be claimed for the engineering fraternity that there is less personal jealousy in it than in the other professions.

It would seem therefore, that there is an important distinction to be made between different sets of professions when the question is raised as to how far guild and legislative restrictions are allowable. In medicine and law, both inexact professions in which it is difficult to establish standards in any other way, a certain amount of trades-unionism and State regulation may be a good thing and justifiable on the score of public policy. In engineering, the operations of which speak for themselves and can be fairly judged by the laity, the same reasons do not obtain. The profession has accordingly always escaped the taint or suspicion of narrowmindedness. That is *something*.

NEW PUBLICATIONS.

THE THERMO-ELECTRIC MEASUREMENT OF HIGH TEMPERATURES. Bulletin 54, United States Geological Survey, By CARL BARUS. Government Printing Office, Washington, 1890. Paper, 8 vo., 313 pp.; 108 diagrams. Price, 25 cents.

In this bulletin Dr. Barus gives an account of experimental investigations conducted by himself, with the assistance of Drs. Strouhal and Hallock, beginning in 1882. An introductory chapter summarizes the different methods of pyrometry which have been heretofore proposed. These are classified by the author under no less than 17 heads, and a short discussion of the merits or disadvantages of each is offered. The first four chapters detail the experiments performed and contain many original computations of constants. In chapter V. the pyrometric use of the principle of viscosity is discussed at some length, and the author describes a new method of high temperature measurements based on the viscous behavior of gases.

FOSSIL WOOD AND LIGNITE OF THE POTOMAC FORMATION. Bulletin 56, United States Gegical Survey. By FRANK HALL KNOWLTON. Government Printing Office, Washington, 1889. Paper, 8 vo., 72 pp., 7 pl. Price, 10 cents.

The author lays stress upon the greater reliabiliy of a microscopial study of the internal structure of plant fossils than what is termed the superficial method (that which deals mainly with the form and nervation of leaves, the scars and striations on stems, and the casts or impressions of stems, leaves and fruits). Professor Knowlton claims for paleobotany a high value in the determination of stratigraphy, though the science is a compatively new one and has probably advanced more in the last dozen years than in all its previous hiftory. The author gives an interesting sketch of the development of paleobotany, mentioning the publications of the pioneer investigators, and then proceeds to describe the fossil woods found in the Potomac formation, of which several new species are figured in the plates.

WORK DONE IN THE DIVISION OF CHEMISTRY AND PHYSICS, IN THE FISCAL YEAR 1886-'87. Bulletin 55, United States Geological Survey. F. W. CLARKE, chief chemist. Government Printing Office, Washington, 1889. Paper, 8vo., 96 pp., 16 diagrams. Price, 10 cents.

The scientific contributions which make up this bulletin are mainly on chemical mineralogy. Thus there are papers on the mica group; analysis and composition of tourmaline; rare copper minerals from Utah; general mineralogical notes; analysis of borates and borosilicates; Arkansas and Kentucky meteorites; scorodite, and a physical paper on the behavior of solids under high pressure.

A good point is made in stating many of the analyses. In one column are given the bases and acids "as analyzed" or "found," and in a separate column are placed the conventional combinations under the headings "probable combination" or "hypothetical combination." This is an improvement upon the too common practice of stating baldly, as actual combinations, theoretical groupings whose actual existence is doubtful, and which cannot be proved.

MIDNIGHT TALKS AT THE CLUB. Edited by AMOS K. FISKE. Published by Fords, Howard & Hurlbert, New York 1890. Cloth, 16mo, 298 pp. Price, $1.

If Mr. Fiske had lived eight or ten generations ago, and had then ventured the publication of "Midnight Talks," he would inevitably have been carbonized at the stake after the now obsolete method of open heap roasting then practised, with perhaps preliminary hand dressing on the rack as a preparatory stage for putting his mind in proper shape for the final treatment. It is significant of the progress of the times that this book, printed at the close of the nineteenth century, will be accepted by a large majority of readers as a rather conservative exposition of current thought. Still, one has a suspicion that the "compiler," as Mr. Fiske terms himself, does not always express his views quite so positively and frankly as he would like to do. There is an under-current of even more advanced opinions which are outwardly suppressed, evidently for fear of shocking ultra-orthodox readers; and this partial reticence shows that in spite of the boasted liberality of the day, writers (excluding the cranks and fanatical "reformers") do not always put in print what is freely said in conversation.

The mechanism of "Midnight Talks" is the old one, the adoption of recorded conversation to develop the argument between persons of different shades of opinion, the dialogue often running into a monologue by the principal speaker. But Mr. Fiske pulls the strings so adroitly and makes his characters so individual and self-consistent, that this ancient mode of construction comes to us with an air of freshness, and is handled in an altogether more dexterous manner than is usually the case.

There are four characters who form the "Owls" conclave of the "Asphodel Club"—a young lawyer of orthodox proclivities, a charming pagan of a *vieux moustache*, the "Judge" (who does most of the talking and expounds the "compiler's" ideas), and the "listener" (that is, the compiler himself, who is supposed to write up the conversations from memory). The topics discussed are religious, political and social problems, and they are treated in a perfectly natural way, just as is being daily and nightly done in many of the real clubs. The eighteen short talks reported cover a wide range of themes of timely interest. The conclusions reached by the "Judge," who acts as a sort of referee, will, of course, not meet with universal approbation; but they are certainly those accepted by a very large and influential class of the civilized men of today. The chief merit of Mr. Fiske's work is the careful avoidance of crankism and temper in discussing subjects which are too seldom talked about dispassionately and judicially.

Most of the chapters are reproductions of matter which appeared in the Sunday issues of the New York *Times*, and which attracted no little attention during their original publication.

The typography, paper and binding are in exceptionally good taste.

ANNUAL REPORT OF THE STATE GEOLOGIST OF NEW JERSEY FOR THE YEAR 1889. Published by the State Geological Survey, New Brunswick, 1889. Boards, 8vo., 112 pp. Distributed free.

Since the death of Dr. George H. Cook, State Geologist, September 22, 1889, Mr. Irving S. Upson has acted as assistant in charge of office Mr. F. L. Nason continues as assistant geologist and Dr. John C. Smock acts as consulting geologist. There are several other members of the force.

The report pays a deserved tribute to the memory of Doctor Cook, who "for more than a quarter of a century filled the position [of State Geologist] with rare acceptibility and efficiency."

The topographic and magnetic surveys of the State are completed, and the first volume of the final report has been printed. Vol. II. is ready for publication, and Vols. III. and IV. are planned. Thus far the free distribution of the annual reports, maps and other publications has been of great benefit to the State, and the issue of the final volumes is awaited with interest.

The present report contains chapters by Prof. E. A. Bowser on the geodetic survey; by Mr. F. L. Nason on geological studies of the Archæan rocks; on the Triarsic or redsandstone and trap rocks; on drainage, by Mr. G. W. Howell; on water supply and artesian wells, by Mr. C. C. Vermeule; a list of publications of the survey, the personnel, and expenses, concluding with statistics of iron and zinc ores.

Chapter VIII. is especially instructive. It is a statement of expenses, and is so terse that we quote it entire: "The expenses of the survey have been kept strictly within the annual appropriation of $8,000, and its bills are all paid." The New Jersey survey has always been economically managed and has succeeded in doing good work with very little money. In this respect it has been a model which it would be well for similar scientific organizations to follow. Another feature of this survey is that it has adhered to the line of investigation for which it was put on foot and for which it has been supported by the state—the economic side of geology and the material development of local resources.

The iron ore production of New Jersey in 1889 was slightly higher than in 1888, but far below the output of many previous years. The production of zinc ore in 1889 was the largest yet recorded for a single year. Below are the statistics for the past tenyears:

PRODUCTION OF IRON AND ZINC ORE IN NEW JERSEY, 1880-89.

Year.	Iron ore. Tons.	Zinc ore. Tons.
1880	745,000	23,311
1881	737,052	49,178
1882	932,762	40,138
1883	521,416	56,085
1884	393,710	40,094
1885	330,000	38,526
1886	500,501	43,877
1887	547,589	50,220
1888	417,738	48,377
1889	482,169	56,154

PAVEMENTS AND ROADS: THEIR CONSTRUCTION AND MAINTENANCE. Compiled by E. G. LOVE, Ph. D. Published by the *Engineering and Building Record*, New York, 1890. Cloth, 8vo, 410 pp. Price, $5.

Mr. Love bas done a public service in bringing together this information on pavements and roads in book form. At present there is an urgent demand for practical knowledge of this kind, especially in this country, where we are now passing through a transition stage and seeking to better the condition of the thoroughfares. It must be confessed that, taken at large, the practice here has by no means been up to the best standards, though there are notable exceptions, as, for example, the streets of Washington and some of the suburban driveways. Consequently, when it is sought to remodel systems, as is now being done in so many American cities, to say nothing of the country highways, it becomes necessary to seek for the guidance of the experience gained abroad in the thickly populated European countries, where heretofore the most attention has been paid to the subject, thus avoiding costly and unnecessary experiment in directions already explored. By concentrating in this compilation the results reached in foreign practice, Mr. Love places a fund of information at the disposal of officials and engineers who have not had the advantage of personally studying the European methods.. At the same time he gives much space to discussions of American practice, hitherto contained mainly in the transactions of a few engineering societies, and available for the use of a limited number of engineers. The editing is to be commended for the selection of matter relating to actual experience, and capable of being tested and compared by means of the numerical results quoted. As might be expected in a compilation of the kind, the student will sometimes meet with discrepancies in the statement of the claims of rival systems; but nothing is lost by presenting a wide option of method, in a matter where the conditions to be met vary so greatly.

The material from which the book is made up originally appeared in the *Engineering and Building Record*, of New York. The compiler has eliminated what was merely of temporary and local interest, and appears to have kept in view the idea of producing a reference book of general applicability. The statements of cost and endurance in different places, being based on the records of actual trials, will serve as valuable data for estimating corresponding cost and endurance in other places where the variation in conditions is exactly known, and this feature of the book is the most useful one. We think, too, that the compiler has done well in letting the contributors speak for themselves in presenting the claims of different systems and the results of their experience.

The book is in three parts: I., on pavements, containing chapters on stone, wood, asphalt and brick pavements, curbs, sidewalks and tramways, street opening and maintenance, and miscellaneous notes; II., on the construction and maintenance of roads, to which about a hundred pages are devoted; and part III., which reproduces a series of prize essays on roads.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review in another page of the Journal.]

Annual Report of the Territorial Geologist to the Governor of Wyoming. By Louis D. Ricketts, D. Sc., Territorial Geologist, Cheyenne. Published by the State. January, 1890. Pages, 80. Illustrated.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

The Cook Amalgamator.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of July 5th you published an article written by John H. Paddock, of St. Johnsbury, Vt. Your correspondent stated that the Cook amalgamator is the Coleman separator rechristened, and that it is unfortunate that I did not continue my investigations as some valuable appliances belonging to the Coleman machine seem to have escaped my attention, which in time I might have discovered and thus appropriated the entire Coleman invention. Thinking your correspondent must be familiar with the subject to express himself in such a positive manner, I have submitted his letter to my patent attorneys, Messrs. Howson & Howson, of Philadelphia, with instructions to investigate and to secure me a copy of the Coleman patent, for I cannot understand how an invention (that your correspondent says "is so near like mine if not too close to be accidental is certainly confusing,") should have entirely escaped the critical eyes of the commissioner of patents and examiner in charge of that department at Washington, D. C., as well as the different patent attorneys I have employed for securing the six United States patents I have on my machine ranging from May, 1883, to July, 1890, and in one case I paid some $50 extra for a thorough search, and copies of all United States patents on amalgamating machinery that might in any way conflict with my machine. Still Mr. Paddock's machine patented by Mr. Coleman, did not come to light.

When I receive a copy of Mr. Coleman's patent from Washington, D. C., I will be better informed as to the similarity of the two machines and able to enter more fully into the details of the subject at issue; in the meantime I rely upon your courtesy to find room in your next issue for this letter, as Mr. Paddock's charge is too serious to remain unanswered for a single week. HENRY COOK.

CAMDEN, July 10, 1890.

Attenuated Scientific Deductions.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: As you refer me in your last issue to the discussion on *Bell's* expermients (ENGINEERING AND MINING JOURNAL of February 18th and 25th, 1888), permit me to quote from that discussion some of its leading arguments and the facts on which they were based, viz.: Page 147: "C. *That deposited carbon is attacked by iron oxide at* 249 *degrees to* 265 *degrees* C. was proved by Bell. Iron oxide, previously partly reduced and richly impregnated with carbon by ignition in carbonic oxide, was heated to this temperature in a sealed tube filled with nitrogen, when carbonic acid and oxide were evolved."

Has it been ascertained that the "richly impregnated" iron oxide did *not* contain CO when it was put into the tube filled with nitrogen? If deposited carbon can absorb and condense gases, then it is likely that some CO *was* introduced by the impregnated oxide into the tube, and in that case there would be no evidence "that the deposited carbon *is* or *can be* attacked by the iron oxide," but much better reason for assuming that CO and CO_2 were evolved by the reactions:

$$O \text{ (from the ore)} + CO = CO_2.$$
$$CO_2 + \text{deposited } C = 2\ CO.$$

It might be objected right here that 249 to 265 degrees C is too low a heat to ensure the reaction $CO_2 + C = 2\ CO$, but that would be a mistake. If the "extraneous" influence, *i. e.*, the heat that *surrounds* the tube is sufficiently intense to allow the iron oxide to part with some of its oxygen, *then the heat set free by the reaction*, $O + CO = CO_2$, *is also sufficiently intense* (and much higher than that outside of the tube) *to make the* CO_2 *react on some of the impregnated carbon* ($CO_2 + C = 2\ CO$) *before losing its intensity by radiation*, *i. e.*, before it sinks to the level of the "extraneous" temperature.

"D. *That it is attacked by carbonic acid at about* 417 degrees is probable, for at this temperature this gas rapidly attacks soft and sometimes slightly affects hard coke. But deposited carbon in Cleveland iron ore, whose iron had been removed by digestion in acid and which therefore held only carbon and gangue, was not acted upon by carbonic acid at 260 degrees C."

This is no proof that deposited carbon should not be attacked *more* rapidly than soft coke. The acid which dissolved the iron, probably also dissolved some of the (siliceous) gangue, and the dissolved gangue, adhering to the carbon, is apt to protect the latter against the attacks of the carbonic acid.

As to the deposition of carbon in the blast-furnace, and as to its subsequent decomposition, I think that the whole ground is covered by the following:

$$FeO + 3\ CO = Fe + C + 2\ CO_2$$
$$= Fe + 2\ CO + CO_2$$
$$= FeO + 3\ CO$$
$$= FeC + 2\ CO_2,$$

deposition, decomposition, reoxidation and carburization occurring, according to the changing extraneous influences, exactly in harmony with the general laws which you have adduced in the opening article.

Much more might be said on the same subject, but as you may not desire, for the present, its further attenuation in your columns, I confine myself, in conclusion, to the statement that I have not discovered anything in the discussion referred to nor in the cited facts, which I can accept as evidence in favor of the following propositions:

1. That CO can oxidize metallic iron.
2. That iron oxide and deposited carbon can react on each other.
3. That carbonic oxide *cannot* completely reduce iron oxide *when the respective reagents are not confined*. Respectfully, A. D. ELBERS.

HOBOKEN, N. J., July 1st, 1890.

P. S.—Allow me to correct a typographical error that occurred in my last communication on this subject. In the second paragraph it should be "Berthelot's thermo-chemical." The name is correctly stated later on. A. D. E.

Darby's Recarburizing Process.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In reply to the queries of your correspondent, in your issue of the 5th inst., I have to say the following:

The Darby process, as far as I understand it, is a useful method for treating molten steel that contains oxidized iron; its chief merit seems to be that a limited proportion of the combined carbon, which is usually lost by so-called "after reactions," can be restored to the metal by mixing the latter with carbon *before* these after reactions have subsided. The air, with which the steel comes in contact in flowing from furnace to filter, oxidizes the steel to some extent; the filter-carbon gets oxidized to some extent by the gases that are occluded in it, and the hydrogen of the steel probably helps also; but the *essential* reactions I take to be:

No. 1. $6\ FeO + 3\ FeC = 9\ Fe + 3\ CO_2$.
No. 2. $3\ CO_2 + 3\ C$ (filter-carbon) $= 6\ CO$.
No. 3. $6\ CO + 2\ FeO = 2\ FeC + 4\ CO_2$

and these alone are to be herein considered.

The CO_2 of the first equation—the product of the after-reaction—consumes the filter-carbon, the resulting CO reacts on the remaining FeO and thereby changes again to CO_2, and the latter escapes.

Hence *three* equivalents of filter carbon can restore *two* equivalents of carbide-carbon.

Now let us consider the change of metal that would only retain 0·1 per cent. of carbon if it were not filtered, to Darby steel containing 0·3 per cent. At the rate of 0·1 per cent., twenty-four pounds of carbon are in combination with 24,000 pounds of metal; and the latter, in order to become carburized to 0·3 per cent., must initially contain three times as much of FeO and of FeC as has been set down in the foregoing equations Then the resulting proportions will be:

With 24,000 pounds of metal:

24 FeO = 384 pounds O = 1·6 per cent.
9 C (filter-carbon) = 108 pounds C = 0·45 per cent.
Resulting carbide-carbon (6Fe C) = 72 pounds C = 0·3 per cent.

Considering that even basic *converter* steel frequently contains three times more of oxygen than of carbon (0·3 : 0 1 per cent.) before it has been dosed with ferrosilicon, the ratio of 1·6 : 0·3, or of $5\frac{1}{3}$: 1, does not seem extravagant for basic open-hearth steel. Aside from the circumstance that some of the CO is apt to escape unused, the 24,000 pounds of metal have to expel 12 CO_2 = 528 pounds = 2·2 per cent., and this quantity of waste gas (used-up CO) can neither burn up the funnel through which it escapes, nor can its escape from the metal produce violent ebullition.

According to the foregoing computation, *one* per cent. of filter-carbon cannot yield more than 0·66+ per cent. of carbide-carbon, and in order to secure the latter percentage for steel that would only have 0·10 per cent. if it were *not* filtered, the metal would have to contain, initially:

$$0{\cdot}66+ \times \frac{1{\cdot}6}{0{\cdot}3} = 3.56 \text{ per cent. of oxygen, } or \text{ 16 } per\ cent.\ of\ FeO.$$

Hence—as long as your correspondent does not state positively that steel containing 0·1 per cent. of carbon has been enriched with 0·85 per cent. by its exposure to 1 per cent.—I prefer to doubt that such a thing can be done. I beg to note here, also, that the eight sets of analyses introduced by your correspondent in his paper of the 5th inst. do not include a case with 0·95 per cent. of carbon, and that it does not appear, from said statistics, *that any two of the sets exhibiting a large difference, in their respective percentages, apply to steel made in the same heat.*

Your correspondent is, however, perfectly correct in claiming that ingot iron is apt to *lose* carbon when it is passed through a chemically inert filter. In that respect my statement of May 10th, page 533, is wrong, and I beg to thank your correspondent for having discovered the error.

As to the ultimate result of filtering over carbon, viz., $FeO + 3\ CO = FeC + 2\ CO_2$ (compare with equation No. 3 in this article), I maintain my position. The initial and intermediate changes having already been explained in previous papers, I merely mentioned, in the letter or statement above referred to, the final one. As your correspondent has, apparently, thereby been misled into making erroneous deductions, a reply to his objections, in the order in which they are put (sub. I.–IV.), would only tend to obscure the whole subject. I have, therefore, tried in the foregoing to put the discussion in such shape that those who have not followed my previous articles on indirect carburization may be able to understand it.

Respectfully, A. D. ELBERS.

HOBOKEN, N. J., July 10, 1890.

[To more fully explain this process, and illustrative of the article on the subject in our last issue, we annex a cut.—ED. E. AND M. J.]

NOTES ON ALLOYS.

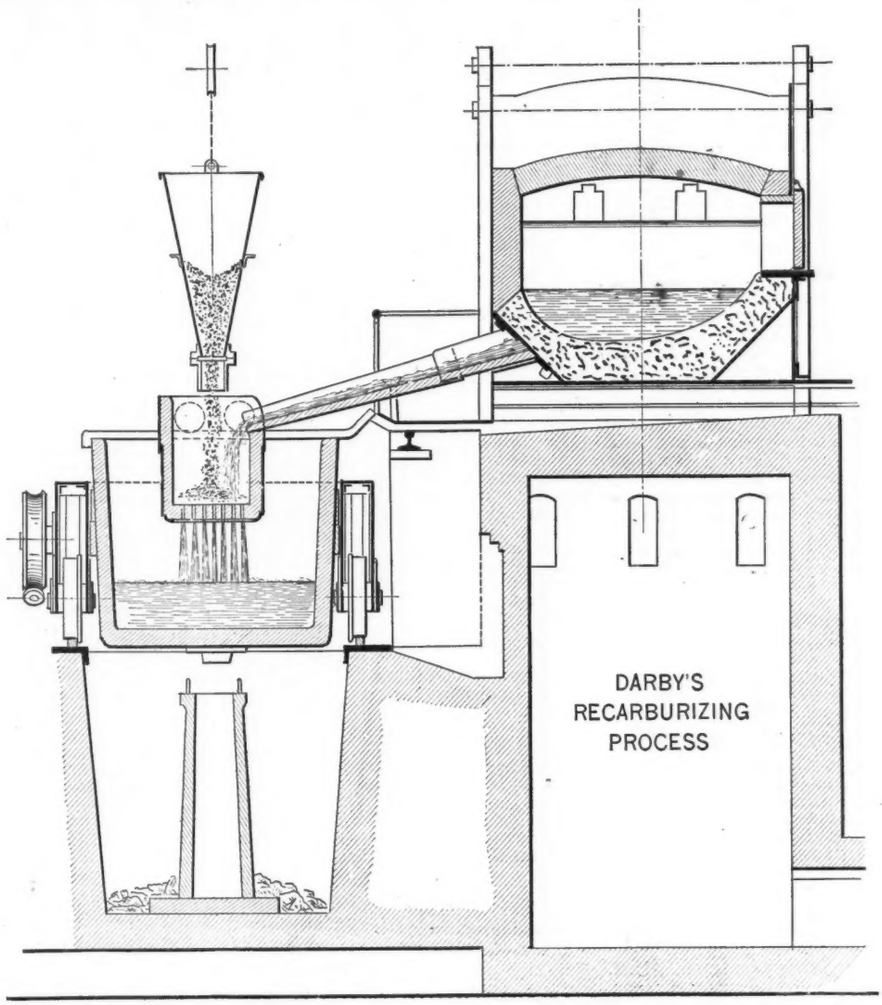
At a meeting of the Society of Arts in London recently, Professor W. C. Roberts-Austen, speaking on the "Art Metal Work of the Japanese, and the Alloys Used by them," said that he had, for some years, made a special study of the constitution of these mysterious and remarkable alloys, and he has succeeded in reproducing all the colors and effects which are characteristic of Japanese art metal work. From the exhaustive analyses which he has made of a great variety of ornaments, plaques, etc., it appears that there are four chief alloys whose names and constitutions are as follows: Shaku-do: copper, 94·50; silver, 1·55; gold, 3·73; lead, ·11; iron and arsenic, traces; total, 99·89. Shibuishi: copper, 67·31; silver, 32·07; lead, ·52; gold, traces; total, 99·90. Kuromi: copper, 98·04; antimony, 1·96. Bronze: copper, 76·9—87; tin, 23·1—13.

There is also a fifth alloy, viz., Japanese brass, which occurs in the various ornaments, but its constitution has not yet been published. The most striking feature of these alloys is that the precious metals take the place of tin and zinc in English alloys. Shaku-do is generally of a dark purple color, but the slightest variation in the percentage of the gold in it makes a great difference in the color. The class of alloys called Shibuishi are all of gray color, and are both light and dark. Kuromi is mostly copper and has from ·2 to 2 per cent. of an admixture of other metal, such as bismuth, nickel, iron, arsenic and gold, and the colors vary between wide limits, from brown and red to purple-black. The colors of each alloy may be varied by the production of coats of oxides or salts

of the metals. This is done chiefly by pickling solutions, by heat and by atmospheric exposure. It has also been suggested that some of the effects may be obtained by exposing the surfaces to the action of certain fumes. It is hardly necessary here to go into the details of the artistic effects produced by the judicious blending of these alloys, or to discuss the fitness of embodying both color and texture in a work of art; neither will our space allow of our quoting examples of the extraordinary beauty of some of the Japanese inlaid designs. Suffice it to say, that at the South Kensington Museum there is an admirable collection of specimens of this art.

There is also an alloy used largely by the Japanese called Moku-me, resembling marble in its texture. It is formed by taking sheets of the above-named alloys and laying them one upon each other, and then twisting, folding, punching and welding them in all manner of ways. When the surface of such a mass is polished it presents the appearance of marble, with the different colored streaks winding about like a maze. The effects produced by these operations are extremely delicate and beautiful. Though no Western artists have successfully reproduced any of the inlaid work of the Japanese, yet Christophele, of Paris, and Tiffany, of New York, have executed some admirable work in Moku-me. At the late Paris Exhibition a vase 29 inches high was shown by Tiffany, and the price put upon it was £1,000. Messrs. Elkington have also been successful in manufacturing articles in this manner, but as they could buy them from Japan at a twentieth of the price at which they made them, they hardly felt encouraged to proceed.

Little is known concerning the constitution or properties of the alloys containing three metals, as hitherto investigators have chiefly directed their attention to a study of the binary alloys. Dr. C. R. A. Wright and Mr. Thompson have, however, in a recent paper communicated to the Royal Society, laid the foundation for future work on those complicated alloys which contain three metals. They chose as their first combination the metals tin, lead and zinc, which were melted together and left at rest in a fused condition. When the percentage of tin exceeds a certain amount the mixture remains homogeneous, but when the amount is less than this the mixture separates into two layers, each layer containing the three metals. The limiting quantity of tin in the author's experiments which were conducted at a temperature of 600 to 700 degrees C., was found to be three-eighths of the total weight of the three metals. The heavier of the two layers which separate when the quantity of tin is lower than this, consists of a saturated solution of zinc in lead containing tin, while the upper layer is a saturated solution of lead in zinc containing tin. The tin does not distribute itself equally in the two alloys, except when present in a particular proportion, which varies with the ratio of zinc to lead. With less tin than this, the lighter alloy takes up the excess of tin, and when the amount of tin is in excess of this amount, the lower alloy contains all this excess. They have, therefore, succeeded in obtaining a series of alloys in this way in which separation takes place on cooling, the lower alloy always having the same composition while the lighter one varies in composition, and a second series in which the upper alloy is uniform in composition and the heavier one varies with the amount of tin added. When no tin is added, they further find that lead is capable of dissolving zinc, forming an alloy containing 1·24 per cent. of zinc, and also that zinc dissolves lead to the extent of 1·14 per cent. In the Parkes process for the desilverizing of lead by means of zinc a similar kind of separation takes place, which may be compared with this work of Dr. Wright and Mr. Thompson on the ternary alloys, and it has recently been shown that there is a similar selective action when the attempt is made to form a ternary alloy containing lead and aluminum with a third metal. A peculiar crystalline alloy, containing lead, tin and copper, has recently been examined by Mr. A. French. It was found in a cavity at the bottom of a cupola furnace after being used for lead smelting. On analysis, however, it was found to contain, in addition to these three metals, nearly 4 per cent. of antimony, and traces of iron, silicon and sulphur, and can, therefore, scarcely be regarded as a simple ternary alloy.



Pneumatic Gun Trial.—The trial of the 15-inch pneumatic gun built for the English government took place at Cold Spring, on the Hudson, New York, on the 8th inst., and seems to have been reasonably successful. Regulation steel shells, weighted with sand in place of dynamite, were used. They were of 8 and 10 inch subcalibers. The contract specifications were that 200 pounds of dynamite should be thrown 2,500 yards and 100 pounds, 3,500 yards. These ranges were exceeded.

The initial air pressure varied from 876 to 1,000 pounds. Some irregularity of flight was caused by imperfect balance of the projectiles, but it was claimed that this was due to the sand weights not representing the dynamite charge accurately, and that with service loaded shells no trouble of the kind would be had. The time of flight was 22 to 29 seconds for the longer ranges.

If the system of pneumatic propulsion of high-explosive shells is to be a feature of actual modern warfare, we are reminded every now and then that this country has no monopoly of it. Several foreign powers are experimenting, and beside the guns already supplied there are orders to be filled for a number of other pneumatic guns to be sent abroad.

COMPOUND LOCOMOTIVES IN GERMANY.

Mr. Stambke, of Berlin, read a paper in January last at a meeting of the Verein Deutscher Maschinen-Ingenieure in which he gave the results obtained with compound engines by the various State railway boards. On December 1st, 1889, there were running 118 compound locomotives, and 87 were on order. Of the 205, 16 were express, 35 passenger, 139 freight, and 15 tank engines. The Bromberg State railway board, employing 74 of these locomotives, reports that the coal consumption averages 12 per cent. less than the ordinary engine. The cost of the compound is about $350 more than of the standard engine, but the cost of repairs is no heavier. This board strongly recommends the adoption of compound freight engines.

The Hanover board, with 89 compound locomotives, reports that failures in starting are not more numerous with compound than with ordinary locomotives. The steam supply is always ample, and the tractive power is greater than that of the standard. The premium for economy of coal consumed earned by the drivers of the compound is always higher than that earned by the drivers of ordinary locomotives, although a deduction of 5 per cent. is made against the compound. The amount of sparks thrown out of the chimney is less than with the standard locomotive. The Hanover-Cassel traffic office recommends that in future only compound engines should be ordered.

The Frankfort-on-Main board reports a fuel saving of 17 per cent. in the Nordhausen district and 18 per cent. in the Frankfort. The compound runs steadily at the greatest speed allowed.

The Magdeburg board reports that engines engaged in a variety of work show only three to six per cent. economy of fuel. The compound freight engines drawing heavy loads long distances show from 15 to 20 per cent. economy.

THE COMPROMISE SILVER BILL.

The Secretary of the Treasury is hereby directed to purchase from time to time silver bullion to the aggregate amount of 4,500,000 ounces, or so much thereof as may be offered in each month, at the market price thereof, not exceeding one dollar for $371\frac{25}{100}$ grains of pure silver, and to issue in payment for such purchases of silver bullion Treasury notes of the United States to be prepared by the Secretary of the Treasury, in such form and of such denominations, not less than one dollar nor more than $1,000, as he may prescribe, and a sum sufficient to carry into effect the provisions of this act is hereby appropriated out of any money in the Treasury not otherwise appropriated.

SECTION 2. That the Treasury notes issued in accordance with the provisions of this act shall be redeemable on demand in coin at the Treasury of the United States, or at the office of any Assistant Treasurer of the United States, and when so redeemed may be reissued, but no greater or less amount of such notes shall be outstanding at any time than the cost of the silver bullion and the standard silver dollars coined therefrom then held in the Treasury purchased by such notes, and such Treasury notes shall be a legal tender in payment of all debts, public and private, except where otherwise expressly stipulated in the contract, and shall be receivable for customs, taxes and all public dues, and when so received may be reissued; and such notes, when held by any national banking association, may be counted as a part of its lawful reserve; that upon demand of the holder of any of the Treasury notes herein provided for, the Secretary of the Treasury shall, under such regulations as he may prescribe, redeem such notes in gold or silver coin at his discretion, it being the established policy of the United States to maintain the two metals on a parity with each other upon the present legal ratio or such ratio as may be provided by law.

SEC. 3. That the Secretary of the Treasury shall each month coin 2,000,000 ounces of the silver bullion purchased under the provisions of this act into standard silver dollars until the 1st day of July, 1891, and after that time he shall coin of the silver bullion purchased under the provisions of this act as much as may be necessary to provide for the redemption of the Treasury notes herein provided for, and any gain or seigniorage arising from such coinage shall be accounted for and paid into the Treasury.

SEC. 4. That the silver bullion purchased under the provisions of this act shall be subject to the requirements of existing law and the regulations of the mint service governing the methods of determining the amount of pure silver contained, and the amount of charges or deductions, if any, to be made.

SEC. 5. That so much of the act of Feb. 28, 1878, entitled "An act to authorize the coinage of the standard silver dollar and to restore its legal tender character," as requires the monthly purchase and coinage of the same into silver dollars of not less than $2,000,000, nor more than $4,000,000 worth of silver, is hereby repealed.

SEC. 6. That upon the passage of this act the balances standing with the Treasurer of the United States to the respective credits of national banks for deposits made to redeem the circulating notes of such banks, and all deposits thereafter received for like purpose, shall be covered into the Treasurer as a miscellaneous receipt, and the Treasurer of the United States shall redeem from the general cash in the Treasury the circulating notes of said banks which may come into his possession subject to redemption; and upon the certificate of the Controller of the Currency that such notes have been received by him, and that they have been destroyed, and that no new notes will be issued in their place, reimbursement of their amount shall be made to the Treasurer, under such regulations as the Secretary of the Treasury may prescribe from an appropriation hereby created to be known as "National bank notes; Redemption account;" but the provisions of this act shall not apply to the deposits received under Section 3 of the act of June 20, 1874, requiring every national bank to keep in lawful money with the Treasurer of the United States a sum equal to 5 per centum of its circulation, to be held and used for the redemption of its circulating notes, and the balance remaining of th deposits so covered shall, at the close of each month, be reported on the monthly public debt statement as debt of the United States bearing no interest.

SEC. 7. That this act shall take effect thirty days from and after its passage.

COAL IN THE SOUTH OF ENGLAND.

Professor Boyd-Dawkins, lecturing recently at the Royal Institution in London, on "The Search for Coal in the South of England," said that, as far as he could make out, the general conclusions at which they might arrive from this discovery were, first, that coal did exist in south-eastern England at a workable depth. When, as in Belgium, coal was worked at a depth of 3,412 feet, 1,200 feet was a comparatively insignificant depth. Hence that depth need not be considered at all an obstacle.

With regard to the area of the coalfield of Dover and the coalfield of Calais, he thought there was every reason to suppose that both these borings had penetrated into the same coal, and he could not help thinking that there was a long, narrow trough extending from the area of Calais right underneath the area of Dover. He should mention that many years ago Mr. Godwin-Austen put on record the discovery of a great mass of bitumen weighing many hundredweights which was found in a tunnel in the chalk about three or four miles to the north of Dover, and which he believed was the result of the escape of some of the coal gases from coal measures below. Concerning the range of the coalfield from Dover to Calais, he should just like them to know what Mr. Godwin-Austen's view on that point was. Mr. Godwin-Austen took the run of his coalfield, which was a long, narrow trough, to the north right to the area of London, and along the line of the Thames as far as Reading. That was his line, but it seemed to him that the discovery at Dover, while, of course, it proved the sagacity of Mr. Godwin-Austen in his general principle, threw the line of this trough of coal southward, and he should be inclined to think that that trough of coal would be continuous, probably, along the line of the northern downs. Further, he should be disposed to look for it in the direction due west rather than in any other direction—that was, from the point of observation which was afforded them by the success at Dover. What might they expect this coalfield to be like? It was quite possible that it might be an enormous, deep trough upwards of 100 miles long, such as they found in France; but on the other hand, it might be a small, shattered and insignificant fragment torn away from the original mass of coal measures which formerly covered the whole region. From examination of the coal found, however, which was cubical and not crushed, he thought the latter supposition unlikely. But, of course, the true nature of these coalfields could not be made out without further exploration, and he cordially welcomed all those efforts which were now being made to solve the question of the continuity of the coal fields. There could be no doubt that the particular coalfield discovered was one of a chain, was one which belonged to the series that extended all the way along the line from Westphalia. In 1855, Mr. Godwin-Austen said that if one of these coal fields were struck in southeastern England "the discovery would be followed up, and the rest of the inquiry would be comparatively easy." One had been struck at Dover, and the necessary base was laid for further discovery. These discoveries would, in all probability, restore to southeastern England the manufactures which had so long gone to the coal districts of the west and of the north, and they would put off by many years the evil day when the energies stored up in the shape of coal in these islands should have been spent.

PICK'S SYSTEM OF MANUFACTURING SALT IN VACUO.

We have already, in our issue of April 19th, made reference to the improvement in the manufacture of salt introduced by Dr. Sigismund Pick, of Szczakowa, Austria, and we now illustrate and describe more fully the process, borrowing the illustration from our contemporary *Iron*, and condensing the description from the paper by Mr. Perry F. Nursey, read at a meeting of the Society of Engineers in London.

As will be seen from the illustration, Dr. Pick's apparatus consists of three separate but duplicate sections, each section consisting of four main and closely connected parts. These are the boiling chamber *A* (Fig. 1), the heating chamber *B*, the collecting chamber *C*, and the filtering chamber *D*. The three sections are placed side by side a few feet apart, and they are connected together by pipes as shown. The heating chamber *B* of the first section is placed in communication with a steam boiler, or with the exhaust steam from an engine, by means of the pipe *E*. The boiling chamber *A* of the first section is placed in communication with the heating chamber B^1 of the second section by means of the pipe *F*, the boiling chamber A^1 communicating in its turn with the heating chamber B^2 of the third section by the pipe F^1. This latter section has its boiling chamber placed in communication with a jet condenser and air pump as shown. *G* is the brine inlet pipe to the various sections which is in communication with the brine tanks, the brine being raised by vacuum and supplied automatically to the several sections. *H* is a pipe for automatically conducting the brine from the filtering chambers, *D*, D^1, D^2, to the boiling chamber of each section, under the special conditions which will be explained when the author describes the modus operandi of Dr. Pick's system. *J* is a small pipe which connects the boiling chamber of the first and second sections with the condenser, and is used for assisting in maintaining a vacuum in each of those chambers. In like manner *K* is a small pipe for assisting the vacuum in the heating chambers of the second and third sections by clearing them of surplus air.

The boiling chamber of each section is simply a cast-iron cylinder, of larger diameter than the heating chamber beneath it. The object of the increased diameter is to enable the chamber to contain a large quantity of brine with a minimum of depth and a maximum of evaporating surface. The usual level of the brine is seen in the first section, which in fact is a sectional view of a single apparatus, the second and third sections being shown in elevation. The heating chamber consists of a series of conical tubes of comparatively small diameter surrounding a central tube of larger diameter, as shown in the horizontal section at Fig. 2. The whole of the tubes are inserted in a tube plate at top and bottom, and inclosed in a cylindrical chamber, into which steam is admitted in the first section by the pipe *E*, and after imparting its heat to the brine it is condensed, and passes away to a steam trap as shown. In the second and third sections the condensed water is drawn off by pumps.

The reason for having the tubes conical is to prevent scaling, or, should scaling take place, that it may be easily removed, the larger diameter of

the tubes being at the bottom. The author's experience of the working of the system, however, leads him to believe that scaling will not take place, so moderate is the heat applied, so rapid the circulation of the brine, and so powerful the ebullition maintained. It is to promote and increase the rapidity of the circulation that the central enlarged tube is employed. In operation, the brine heated by the small tubes passes upward through them to the boiling chamber. It then makes for the center, and returns downward through the large central tube by reason of the lower temperature prevailing within that tube. The proportion of the volume of brine to the heating surface being much greater in the large tube than in the smaller tubes causes a reduced temperature within it, and the rapidity of the circulation is thereby increased in accordance with the natural law that heated fluids or gases ascend while those of a lower temperature descend.

The settling chamber, immediately beneath the heating chamber, serves for collecting the salt as it is precipitated. It settles readily, as no movement takes place in the brine at that point. It is, of course, in direct communication with the upper or boiling chamber through the tubes of the heating chamber. This collecting chamber terminates in a sluice valve, and is in this way connected with the vacuum filter beneath it, which forms an important and essential feature of Dr. Pick's system. Each filter consists of an upper fixed portion and a lower hinged portion, the filtering medium being attached to the lower portion of the filter at its junction with the upper part. The upper part is fitted with an air inlet cock and a water pipe, ending in a rose for washing the salt lies as in a bath is automatically transferred to the vacuum chamber, leaving the charge of salt resting on the filtering medium and perfectly free from brine. The valve on the ascension pipe is then closed, the filter opened, and the charge withdrawn. The filter is then closed ready for another charge of salt.

It will be observed that during the operation of letting down the charge of salt and withdrawing it from the vacuum filter, it is not necessary to stop working, the processes of evaporation and production being thus rendered simultaneous and continuous, and, above all, automatic. It was by devising this system of communication between the lower and the upper portions of each section that Dr. Pick was enabled to solve the problem of practically and profitably evaporating brine in vacuo. It is the vacuum filter that gives the finishing touch to the triple effect system in present connection, and to Dr. Pick belongs the credit of being the first to succeed, by means of an ingenious but simple arrangement, in utilizing the vacuum system for the manufacture of salt.

The author has hitherto been dealing with a complete apparatus consisting of three sections. The successful working of the Pick system, however, does not depend upon the use of three sections, inasmuch as the finest salt has been, and is still being made, equally well in one section; although, of course, not nearly so economically as if the complete set of three was adopted. In order to demonstrate the practical value of Dr. Pick's invention in England—for it had previously been proved in Austria—a single section, with its air pump and condenser, was erected in the early part of the present year at the Shirleywich salt works, Stafford-

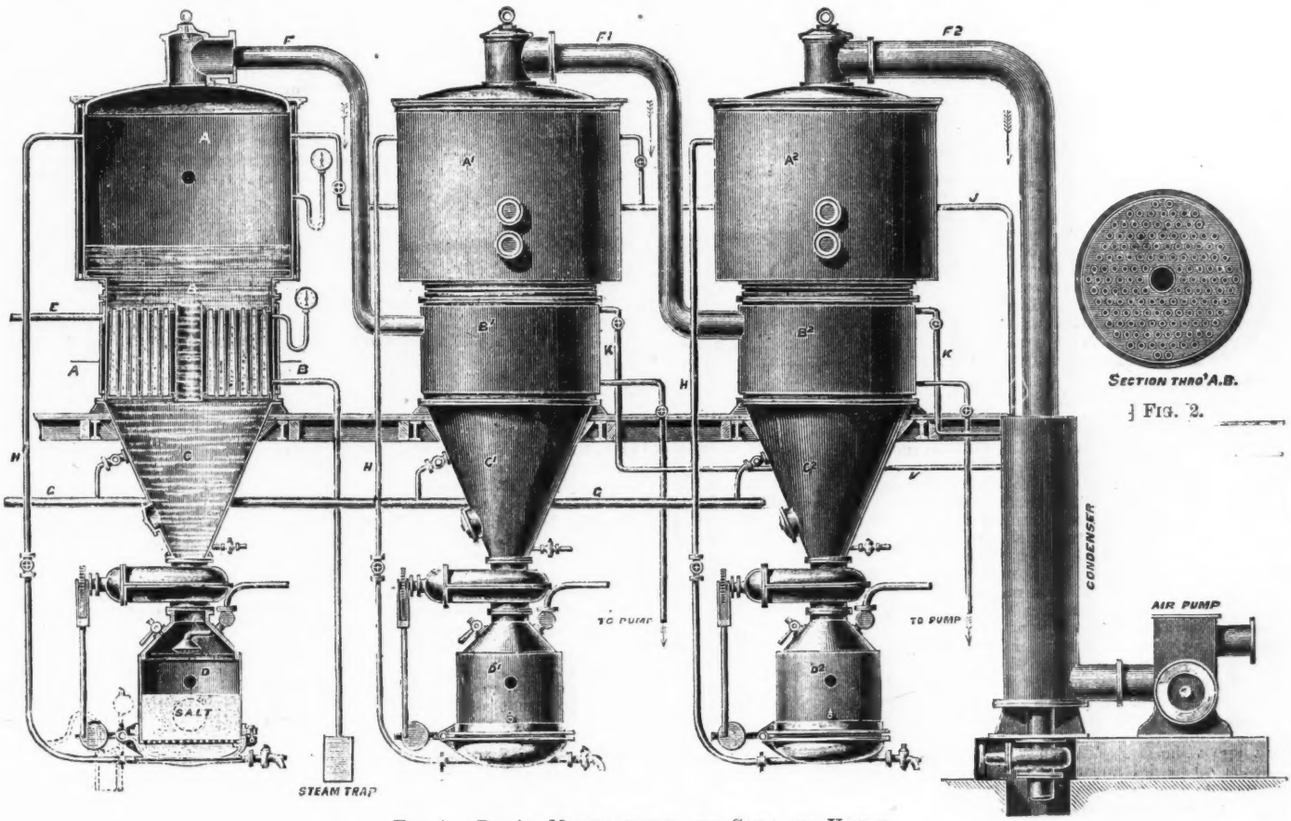


FIG. 2.

FIG. 1. PICK'S MANUFACTURE OF SALT IN VACUO.

salt if necessary. The lower part of the filter is connected with the boiling chamber by a tube, the lower portion of which, as far up as the valve, is flexible, and yields when the filter is opened, as will be seen from the dotted lines in Fig. 1.

The method of operating Dr. Pick's system is briefly as follows: Each of the three sections having been charged with brine to the proper level, which is that indicated in the boiling chamber *A*, steam is admitted to the heating chamber of the first section, in which the highest temperature is maintained. The brine in that section becomes quickly heated, and the steam given off from that brine enters the heating chamber of the second section, heating the brine in that section. The steam given off from the brine in the first section, after doing its work in the heating chamber of the second section, condenses and produces a vacuum in the boiling chamber of the first section, which vacuum is aided, if necessary, by opening the valve on the connection with the vacuum pump. The pressure being reduced, the brine in the first chamber enters into violent ebullition at a comparatively low temperature. The same process is repeated in the second section, the steam chamber of the third section acting as a condenser, and producing a vacuum in the boiling chamber of the second section. The steam generated in the third section is drawn off by the vacuum pump and condensed by the jet condenser as shown. It will be seen that the highest vacuum and the lowest temperature exist in the third section, while the highest temperature and the lowest vacuum occur in the first section. As the salt is precipitated it settles in the collecting chamber, and at stated intervals the sluice valve is opened and the salt and brine are admitted into the filtering chamber. After settling there for a few seconds, the sluice valve is closed and the air cock on the filter is opened. The valve on the ascension pipe *H* is then opened, and in a few seconds more the whole of the brine in which the shire, under the author's supervision. This plant has now been running for several months with thorough practical success as a salt producer. Steam is supplied to the heating chamber of the apparatus from an eight-horse portable engine, which also drives the vacuum pump and jet condenser. It is only a small plant, capable of turning out about one ton of salt per day of 24 hours from saturated brine, *i. e.*, brine containing 2 pounds 6 ounces of salt per gallon, but this it does regularly. In fact, of late, and since the apparatus settled itself down into steady working order, it has on many occasions exceeded this output. A charge of salt weighing about 1 cwt. is drawn every hour without stopping the apparatus, and samples of the salt thus produced lie on the table for inspection. It will be seen that the salt is of the finest quality, and it is a noteworthy fact that the density of the salt produced by Dr. Pick's apparatus at Shirleywich is just double that of the salt produced at the same works and from the same brine by the ordinary open pan process. This will be seen from the samples, inasmuch as the 3-inch cubes of Pick's salt weigh 21 ounces, while the 3-inch cubes of open pan salt weigh only 10½ ounces, or just half.

So far as the working of Dr. Pick's system both in Austria and at Shirleywich has gone, it has proved, in all respects, thoroughly satisfactory, and has amply demonstrated that the best and finest salt can be expeditiously and economically produced by it. Although it has not been possible in the special circumstances under which the apparatus was put up and worked, for the author to ascertain the cost of production, he is perfectly satisfied that, in practice, it will be very much less than that of the ordinary salt-pan system

The practical advantages of Dr. Pick's system have, in the author's opinion, been fully established by the working of the apparatus at Shirleywich. It has shown (1) that a large saving of fuel is effected by it

as against the ordinary salt-pan process. (2) That the space required for turning out a given quantity of salt is very considerably less than that required for an ordinary salt-pan plant capable of turning out a corresponding quantity. A plant capable of producing 50 tons per day will only occupy an area about equal to that covered by a salt-pan producing 40 tons per week. (3) That the cost of labor is reduced to a minimum, the apparatus being very simple in construction and practically automatic in action and not requiring special supervision. (4) That the cost of maintenance will be very small, there being no plates to scale and burn out as in the ordinary salt pan. With regard to scaling the author would observe that he had the apparatus opened after several weeks' continuous working and found the tubes and all other internal parts bright and clean, and perfectly free from any sign of scale. (5) That as the brine nowhere comes in contact with fire, no acid vapors can be formed and given off as in the ordinary process, so that there is an entire absence of those noxious gases which are prejudicial alike to animal and vegetable life. The opinion of the author is that Dr. Pick has succeeded in effecting an important improvement in the manufacture of salt by means of a system which cannot fail to prove both economical and effective. These views are indorsed by practical saltmakers and by some of the leading scientific authorities on the subject. Sir Henry Roscoe, F. R. S., after inspecting the process, states in a report upon it that it is founded on sound scientific principles; that it is automatic and continuous, and is a great improvement on the old process. Mr. Alfred E. Fletcher, H. M. Chief Inspector under the Alkali, etc., Works Regulation Act, who has officially inspected the apparatus at Shirleywich, states that Dr. Pick's system, if adopted for the manufacture of salt, will be a means of removing the great nuisance now arising from the emission of black smoke, and from the corrosive vapors now discharged so copiously from the fires under salt pans. He also observes, in his report, that the change of system will effect a great improvement in the condition of the work-people employed. On these grounds he says he anticipates great public benefit from the introduction of the system.

GEMS AND PRECIOUS STONES.

SCIENTIFIC PUBLISHING COMPANY, 27 Park Place, New York.

GENTLEMEN: I have just received the beautiful copy of the interesting "Gems and Precious Stones of North America," an attention of which you notified me in your letter of May 29th.

Pray receive my sincere thanks and my compliments for the beautiful execution of the plates. Several attempts have been made to represent minerals in colors, but without signal success. You, more fortunate than your predecessors, have succeeded perfectly and your plates 2, 5 and 6 specially are most remarkably effective.

Yours gratefully,
A. DE CLOIZEAUX,
Membre de l'Institut.

JARDIN DES PLANTES,
PARIS, France, June13, 1890.

Engineering News says: This is a superb work that is justly attracting much attention at home and abroad, from the value and interest of its contents, the well earned reputation of its author and from the typographical excellence of its text and illustrations. The manner of treatment is such that while very much technical information of value is given, regarding the location, the appearance and composition of the gems, this more useful material is most pleasingly set in other information that makes it read like a story. It is everything but the dull textbook that it might have been made had it fallen into the hands of a less smypathetic man than Mr. Kunz, or one less broadly informed on all that is properly included under the subject treated.

As the work is confined to the gems of North America, it may surprise some of its readers to find that diamonds are included in its area, and take up in their description the first chapter of 40 pages in this work. They occur, so far, in only two geographically remote and geologically dissimilar regions. The first is a belt of country lying along the eastern slope of the southern Alleghenies, from Virginia to Georgia; the other extends along the western base of the Sierra Nevada and Cascade mountains, in Northern California and Southern Oregon. In the first case the rocks in which they occur belong to the Archaen and Cambrian ages, and in the second case in the middle or later Mesozoic. The diamonds have been found in loose material associated with garnets, zircons iron sand and particularly gold. The diamonds so far found have little more than local interest and moderate value and Mr. Kunz does not think that diamond mining will ever rank as an important industry. The so-called Dewey diamond is the largest, found at Winchester, Va., in 1855, and after passing through various hands, was cut and valued at $6,000. Mr. Kunz says it was reduced from 23¼ to 11$\frac{1}{16}$ carats by cutting, is off-color and imperfect, and is probably worth $400. Mr. Kunz continues with a detailed account of the finding of other diamonds, with many interesting circumstances connected with their discovery, concluding with an account of the celebrated Arizona "diamond swindle" of 1870.

Other chapters treat in an equally interesting manner of the sapphire, ruby, topaz, emerald, turquoise, garnet, beryl, etc. The wood agates and wood opals of Colorado and California furnish a topic of peculiar interest, with tree trunks 150 feet and more in length transformed into chalcedony with its glorious colors; in one case a tree of agatized wood bridges a cañon 45 feet in width. The pearl fisheries of California and Mexico also make delightful reading. A New Jersey pearl found in 1857 was sold by Tiffany & Co. to the Empress Eugenie for $2,500 and to-day it is worth $10,000. The final chapter is on the gems of Mexico and Central America, with special reference to the jade, obsidian and rock crystal implements and ornaments of the old Indian races of this section. Mr. Kunz says that the word jade is evidently a corruption of *ijada*, and the mineral was brought from Peru and Mexico under the name of *piedra de ijada*, or "stone of the loins," in allusion to its supposed curative properties in diseases of the loins and kidneys.

The *London Financial News* says "Gems and Precious Stones" is the title of a sumptuous work written by G. F. Kunz, an American gem expert, and published by the New York Scientific Publishing Company. It deals chiefly with the gems and precious stones found in the United States, Canada, and Mexico, and is historical and exhaustively scientific. Not the least interesting features are the beautifully colored illustrations. The work will no doubt be regarded as authoritative within the limits which the author imposes upon himself, and it will certainly open a good many people's eyes as to the rarer mineral products of the North American continent. Some of the information is very curious.

A NEW FORM OF COAL WASHING MACHINE.

By M. Max Evrard.

This machine is a modification of the ordinary piston or hydraulic jigger, having an arrangement for scraping the surface and removing the top of the washed layer of material under treatment. It consists of a rectangular sieve about 10 feet long and 3½ feet wide fixed on a pyramidal hutch, having a plunger box attached to one of the long sides, and a continuous opening variable by adjustable slides for the discharge of the heavier waste on the other. The apertures in the sieve plate vary in size, the largest being nearest to the feed end. The piston, which is circular in form, and of very much smaller area than the sieve plate, is a wooden disc moved by an eccentric, and communicates motion to the water in the hutch by a cushion of air confined above the water in the piston box. The eccentric is adjustable upon its shaft so as to allow a certain variation in the length of stroke of the plunger. A clack in the disc allows air to enter if a vacuum is formed below it on the return stroke by reason of the whole of the water not being returned, as in the case of washing very fine slack containing clay, which always absorbs a notable quantity of water.

The scraper frame (*cadre a palettes*), which is the essential novelty of the machine, is a harrow-like frame suspended by a system of jointed rods above the sieve plate, and the receiving motion from a cam acting upon the counterpoised arm of an angle lever, which gives a slow forward and quick return motion. The frame, which is somewhat larger than the sieve plate, is connected at one end with the slide closing the feeding hopper, and receives a fresh portion of the material at the commencement of the stroke, which is dropped upon the plate at the coarse end, and subjected to the most energetic action of the water, while the finer portions of previous charges brought to the surface are drawn forward by the teeth projecting from the frame toward the discharging end. The length of stroke of the frame is 20 inches, so that the surface of the washed material is broken up six times in its passage through the 10-foot length of the machine. Usually the frame is suspended at such a height as to pass clear of the charge on the return stroke; but when the slack treated is very dusty, it is so adjusted that by acting on the muddy surface on the backward passage, the return of the water to the hutch may be facilitated. In the latter case care is taken to keep a depth of from 2 to 4 inches of water above the top of the charge to prevent the suspended mud from settling.

The finely divided material accumulating as mud in the hutch is discharged at intervals through a pipe at the bottom into settling basins, and the clear water is pumped back to supply the machines. If the interior of the hutch is divided into two parts, each with a separate discharge pipe, the mud from the first is usually waste, while that from the second, being derived mainly from mixed coal and shale, is generally clean enough to be used for firing colliery boilers. When treating unclassified slack, containing all sizes up to about two inches, the washed material other than the fine surface coal is subjected to a final screening, giving clean coal in lumps from 2 inches to $\frac{1}{16}$ inches, while all below the latter size is ordinary slack with about 10 per cent. of ash.

The fine coal raked off the top of the charge at each stroke, by the last teeth in the frame, which are deeper than the others, is received on an enclosed apron at the back of the sieve, where the bulk of the adherent water drains away, and is ultimately pushed over a shoot into a wagon placed to receive it. The stroke of the piston may be varied within considerable limits by adjusting the eccentric so as to be available for washing lumps of all sizes from $\frac{4}{16}$ inches up to 2 inches in diameter. The number of strokes varies from forty-three per minute for stuff below 1 inch to fifty-five for larger sizes. The weight of these machines is about 6 tons each. They are arranged to work in pairs, each pair requiring a motive power of 4 to 6 horse-power, and one man to attend to them.

The produce is from 12 to 18 tons per hour according to the amount of dust in the slack treated, or an average of 15 tons for two machines. They have been adopted, or are in course of erection, at six collieries in the north of France, and the basin of the Loire, four in Belgium, and three in Spain. In the latter country they have also been applied for alluvial gold washing in the neighborhood of Granada. In the introductory part of the paper, the author, in dealing with the theory of coal washing, describes the method of separating coal from shale by means of a saturated solution of sulphate of zinc, in which coal floats and shale and stones sink, and its application to the assay of coal on a small scale.—*Bulletin de la Société de l'Industrie Minérale;* through *Proc. Inst. Civ. Eng.*

AUTOMATIC APPARATUS FOR CONTROLLING BESSEMER CONVERTERS.

When the Bessemer converter lies horizontally, as shown in the accompanying figure, it is in unstable equilibrium; and, but for the pressure of the water on the piston *V* in the hydraulic cylinder *C*, which controls it, it would tip either forwards or backwards, discharging its contents of molten metal into the pit, and perhaps destroying its own bottom. The bursting of a hydraulic pressure-pipe is liable to relieve this hydraulic pressure on the faces of the controlling piston, and thus to allow the converter to upset, with dangerous, if not fatal, consequences. To prevent this the automatic controlling apparatus, which we illustrate, has been attached to converters at Blaenavon and Ebbw Vale, and, according to the *Engineer* (p. 465, June 6, 1890), with success. The apparatus actually contains several other appliances, but we describe only the method of holding the converter in case the pressure-pipe bursts.

The vessel is prevented from turning in case of such a failure of a pressure pipe, by two means simultaneously applied.

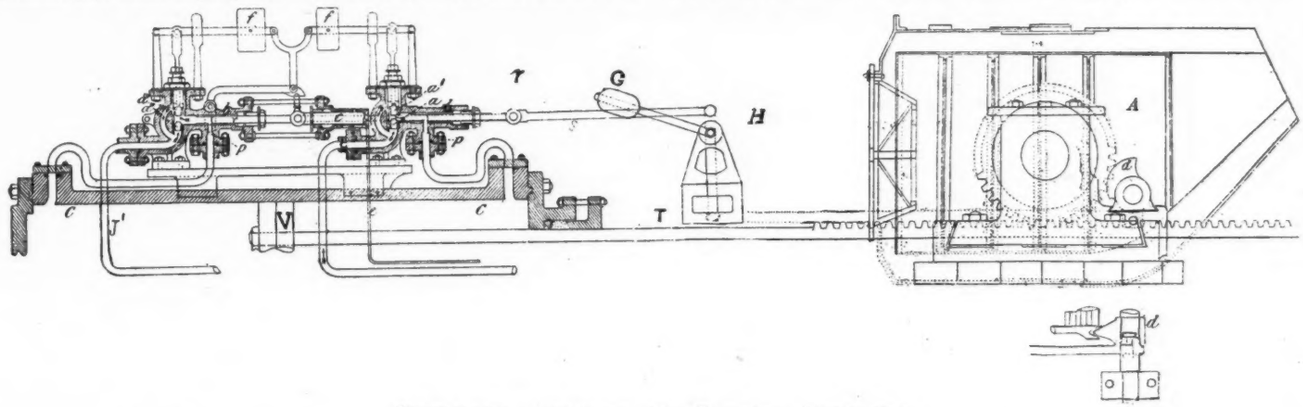
First, the V-shaped pawl or eccentric *d* shown at the right of the vessel-trunnion is rotated to the left, and thereby forced into a V-shaped groove in the pinion itself, thus by its friction locking the pinion. Second, the water is locked in the main hydraulic cylinder *C*. Both of these are

effected by the counterweight *G*. which rocks around the point *H*, and which is connected by the rods *S* and *T* and the levers shown, with the eccentric *d*, and with two little plungers *r r* which control the entrance of the pressure-water into the main cylinder *C*, and its escape therefrom.

The action of the counterweight *G* in throwing the friction-eccentric *d* into gear with the pinion and locking it, is clear enough. To understand its action in locking the water in the main cylinder *C* we must examine the mechanism which stands above this cylinder.

The pressure and discharge water, entering or leaving the main cylinder by the pipes *JJ'*, passes by the little check-valves *a*, *a'*, *a''*, *a'''*, and the little cylinders *bb*, in which play the plungers *rr*. Suppose, to fix our ideas, that we wish to turn the converter to the right, *i. e.*, in the direction of the hands of a watch. Pressure water is admitted to the pipe *J*, lifts the check valve *a*, drives the plunger *r*, and through it the rod *S* to the right, lifting the counterweight *G*, and thus, through the rod *T*, moving the eccentric *d* to the right and out of gear with the converter pinion, thus releasing the converter. In moving to the right the plunger *r* not only thus unlocks the converter pinion, but opens the port *p* leading to the right-hand end of the main cylinder, to which the pressure water now passes freely. But when the water ceases to press on the little plunger *r*, the counterweight *G*, now no longer opposed, descends, both locking the eccentric *d* into the converter pinion, and driving both plungers *rr* to the left, thus closing both ports *pp*, and locking the water in both ends of the main cylinder *C*. Of course, if the water ceases to press on the plunger *r* simply because the stage-boy intentionally cuts it off, so as to hold the vessel steady, this action of closing the ports *pp* is superflous; but if the water ceases to press because a pressure pipe has burst, then this locking action becomes vitally important: but for it the vessel would tip over.

Some may think the arrangement complex, and liable to get out of order; so that, forgotten as such automatic safeguards are likely to be in the fortunately long idle intervals during which no accident occurs, it would not act at the important moment when such an accident finally occurred. Indeed, so very rare is this accident in well-built works, that many will think the precaution on the whole superfluous. Others, again, thinking it worth while to have some way of holding the vessel should a pressure-pipe burst, might prefer to control it by an eccentric like the one



CONTROLLING APPARATUS FOR BESSEMER CONVERTERS.

shown, or by a band-brake or other device, but actuated by the stage-boy, who has the vessel in charge, and not thrown into gear automatically. To this it may be objected that, should such an accident occur, the stage-boy's attention would only be called to it by the fact that the vessel was turning in spite of his having shut the water off; and that, before the meaning of this rare occurrence had come fully on him, and ere he had time to throw eccentric or brake into action, the vessel would have acquired such momentum that an attempt to arrest it would merely wrench the arresting mechanism into pieces.

Zinc and Lead in Burnt Gases from Blast Furnaces, by A. Vita.—Where ores are used containing zinc and lead, the oxides of these metals are contained in the burnt gases. The present paper concerns itself with the quantities of the oxides contained in the burnt gases, when the gases have before combustion undergone a certain amount of "purification." Such "purification" was effected by passing through a Macco's ascension pipe and five tanks, each divided into two parts. Each tank was 14 meters high and had a base of 2 x 3 metres. A distributing channel of 1·5 x 2 metres section conducted the gases thence to the Cowper apparatus. The results obtained show that even after the passage of the gases through this system a notable quantity of zinc and lead still escapes.

Samples were aspirated from the gases after passing the Cowper apparatus, and were passed through five wash-bottles containing respectively water, hydrochloric acid, nitric acid, bromine in hydrochloric acid and alcohol, the last named being intended to absorb any bromine vapor which might pass over.

On six different days 1,202 litres of burnt gases were aspirated and examined. Samples of the unburnt gases were also examined. From the quantity and composition of the materials fed into the furnace in each day of 24 hours, and from the composition of the gases before combustion and after, it was calculated that for every ton of pig iron produced the burnt gases carried off 3·89 kilos. of zinc—that is, so much zinc is totally lost. The zinc recovered for every ton of iron produced was 15 kilos., so that the loss is 27 per cent. of the recovered zinc.

The loss of lead is naturally very much smaller than that of zinc. For every ton of iron produced the flue-dust contained 3·9 kilos. of lead, and the amount lost was 360 grms. Besides the losses here considered, there are other sources of loss. For instance, the furnace-slag contains zinc; loss is sustained at the furnace mouth; the masonry of the furnace takes up zinc.—*Jour. Soc. Chem. Ind.*

SOCIETIES.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The thirty-ninth meeting of the Association will begin in Indianapolis on Tuesday, August 19th, 1890, at noon, by a meeting of the Council at the Denison House, where will be the hotel headquarters of the Association. By special favor of the State authorities, the general sessions and the meetings of the sections will all be held in the new and commodious State House, where also will be the offices of the local committee and of the permanent secretary.

This meeting will be the fiftieth anniversary of the organization of the Association of Geologists and Naturalists, the parent of the A. A. A. S., which will add to the interest of the meeting. The arrangements made by the Local Committee for the comfortable entertainment of the large number of members and their friends expected to be present, and the unusual accommodations offered, by which all the sections will meet in large halls under one roof, will probably make this the most important meeting ever held in the West. Indianapolis is as comfortable in August as any city away from the sea-coast. Its streets are wide and well shaded, and its hotels are large and comfortable, so members need not be deterred from going there by the fear of extra heat and discomfort.

On Wednesday, August 20th, the first General Session of the meeting will begin at 10 o'clock in the forenoon in the House of Representatives.

After the adjournment of the General Session the several sections will organize in their respective rooms.

In the afternoon the vice-presidents will give their addresses before their respective sections, and in the evening there will be a general session, when the retiring president, Prof. T. C. Mendenholl, will deliver his address.

The sessions will continue until the Tuesday evening following, and on Wednesday morning, August 27, a meeting of the council will be held. Saturday, August 23, will be given to excursions. The meeting will close with excursions extending to August 30.

The citizens of Indianapolis are invited to be present at the General Sessions of the Association, at the meetings of the sections, and at the special evening lectures given under the direction of the Association.

The Local Committee will secure board and lodging for members and their families at moderate rates in several hotels and boarding houses within easy reach of the place of meeting, and as the Local Committee will provide a lunch at the State House, members will not be obliged to leave the cool and comfortable building during the heat of the day. In the evening, when not otherwise engaged, it is expected that the members of the Association and of the Local Committee will meet socially in the reception rooms at the Denison House.

A special circular in relation to railroads, hotels, excursions and other matters will be issued by the Local Committee, and members who are about changing their address for the summer should notify the Local Secretary at once, and he should be addressed upon all matters relating to local arrangements and in relation to transportation.

For all matters pertaining to membership, papers, and business of the association, address the Permanent Secretary at Salem, Mass., up to August 15th. From August 15th until August 30th, his address will be the Denison House, Indianapolis, Ind.

In anticipation of the circular to be issued by the local committee, it is only necessary here to give the names of Dr. George W. Sloan, Chairman of the Committee, and of Alfred F. Potts, Esq., Local Secretary, Indianapolis, Ind.

F. W. PUTNAM, Permanent Secretary.

SALEM, Mass., June 25th, 1890.

SPECIAL NOTICES.

The Entomological Club of the A. A. A. S. will meet at 9 A. M., on Wednesday, August 20, in the room of Section F, State House, where members of the club will register and obtain the club badge. President, Prof. A. J. Cook, Agricultural College, Mich.; Secretary, F. M. Webster, Lafayette, Ind. Members of the club intending to contribute papers will send titles to the Secretary.

The Botanical Club of the A. A. A. S. will hold a meeting on Thursday, August 21, at the State House. Communications should be sent to the President, Dr. N. L. Britton, Columbia College, New York, or to the Secretary, Dr. Charles R. Barnes, University of Wisconsin, Madison, Wis.

The Society for the Promotion of Agricultural Science will hold its eleventh annual meeting in Indianapolis, beginning Monday evening, August 18th, in the room assigned to Section I in the State House, and continuing on Tuesday. For further information address Prof. W. R. Lazenby, secretary, Ohio State University, Columbus, Ohio.

The American Geological Society will hold its semi-annual meeting at the State House in Indianapolis on August 19th. Prof. J. D. Dana, New

Haven, Conn., president, and Prof. J. J. Stevenson, University of City of New York, secretary.

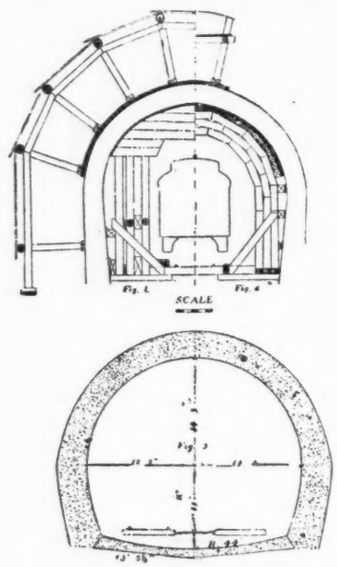
Members of the association arriving in Indianapolis before the meeting should call for information at the temporary office of the local Secretary, No. 19½ N. Pennsylvania street. A few days before the meeting a local office of information will be established near the railroad station, as will be stated in the circular of the local committee.

A meeting of the council will be held at noon, on Tuesday, August 19th, when all nominations for membership received by the permanent secretary up to that time will be acted upon.

REPAIRING THE ARCH OF THE MUSCONETCONG TUNNEL.

From a description in the journal of the Engineering Society of the Lehigh University, by T. C. Bailey, Jr., published by permission of the Lehigh Valley Railroad, of the interesting and difficult work carried out in repairing the Musconetcong Tunnel, we take the following:

The tunnel was commenced in April, 1872, and, owing to the difficult



nature of the ground, was not completed for three or four years. It is 5,136 feet long, and at the west end it passes through 770 feet of soft ground, 702 feet of which is arched, the remainder being taken out in open cut, 450 feet of limestone, 263 feet of loose rock and 3,731 feet of syenite, declared by prominent judges to be harder and tougher than any rock encountered along the line of the Hoosac Tunnel.

That portion of the tunnel through the earth and also where the loose rock was encountered at the junction of the limestone and the syenite were arched, there being 50 feet of stone arching at the west end, the remainder of brick. The backing was dry rubble.

For a number of years the brick arch gave good satisfaction, but finally it began to fail. Longitudinal cracks were opened and at last it grew so bad that the bricks would fall out under the jarring of the passing trains. The cause of this failure is not known; the mortar used had not been injured by the water, it was found afterwards. It is probable that the rubble backing was not packed tight enough, thus allowing a pressure from above to be transmitted directly to that portion of the arch below, instead of being distributed uniformly over the entire arch.

Several remedies were suggested and plans made, but first it became necessary to timber the failing part, or there was danger of the entire arch collapsing. The great problem was to put in solid timbering and still not interfere with the trains. The double track was changed to a single one raised on sills and timbering put in as shown in Figs. 1 and 2. The first kind (Fig. 1) was used for 255 feet at the west end, 215 feet of this having knees, and 410 feet of the second kind (Fig. 2). The tunnel starts at station 676+65 and at station 678+20 double timbering was used on account of the character of the arch at that point. The bents are five feet apart, center to center, of pine and hemlock, the sills are 8 inches by 12 inches, the posts 12 inches by 12 inches; and the corbels 12 inches by 12 inches. To withstand any lateral pressure the bents are connected by short stints, 12 inches by 12 inches, hemlock. It will be seen by an inspection of the figures that this timbering is put up in the most substantial manner. The second kind is considered the best, as in it no distortion can take place unless the bents break. This work was commenced in April, 1888.

As for repairing the arch, many plans were suggested. One was to take out the old arch in sections and replace it by a stone arch; another, to take out the old arch as above, replacing it by a concrete one resting upon the old side walls. Neither of these was adopted, but after much deliberation it was decided to excavate above the old arch and back of the old walls and fill in with concrete, removing the old arch after the concrete had set.

In June, 1888, the old shaft was opened and a heading run both ways along the crown of the arch. This heading was six feet by six feet, through very heavy earth and heavy timbering; bull pine in pieces of from 10 to 12 inches diameter was used and proved very satisfactory; it was much more economical than hemlock, costing less than one-third as much per running foot. The bents were put three feet apart, center to center, allowing a clear space of 5 feet by 5 feet. Fig. 2 shows the method of timbering these headings. After being run for about fifty feet the heading was then extended down along the line of the arch to a firm foundation back of the side walls, every other bent being knocked out for this purpose and replaced by timbering as shown in Fig. 1. Along the crown of the arch 6-inch scantling were laid on which the sills, 6 inches by 12 inches, rested to support the stubs. Concrete was then put into a thickness of from 4 to 4½ feet on the walls and haunches to 3 feet 6 inches on the crown, thoroughly tamped, and the space above, about 3 feet, tightly packed with dry rubble, the stories being about 1½ feet each way. The concrete was mixed in the following proportions, by bulk:

Alsen's German Portland cement	1
Clean sand	2¾
Stone	6¼

The sand was from Perth Amboy and of a high order, consisting almost entirely of quartz, with little or no loam; the stone was that taken from the old tunnel, syenitic gneiss and limestone. This concrete sets thoroughly in four hours.

It was found expedient after the work had progressed to open a new shaft. The old one was 140 feet deep, and 330 feet west, or 150 feet from the end of the tunnel was sunk the new one. From this shaft the headings were run to the ring stones of the tunnel facing. The old shaft was filled with 5 feet of concrete, 14 feet of puddled clay, and the remainder with the material from the tunnel.

The concrete invert was put in 30 feet sections on Sundays. The wedges above the corbels being driven out, the bents were jacked up and afterward put down on 6-inch by 12-inch blocks. The invert was laid to the arc of a circle of 44 feet radius, 21 inches thick at the extremities, 15 inches at the middle, laid to a form. It was kept clear of water while this work was going on, by a Worthington pump; at the same time by levers this water could be thrown up the hill through a 1½-inch pipe to be used in mixing the concrete. This mixing was all done near the shafts, the concrete being taken down for use in the invert on an inclined railway; a car descending pulled up an empty one. For pumping the water from the backing a Blake pump was used. Fig. 3 shows the lines of the concrete arch.

While removing the arch, the air back of the masonry was so foul that an air drum had to be put in. This was a Sturtevant drum which is guaranteed to deliver 10,000 cubic feet of air per minute running 600 revolutions. The air was carried along by a wooden box 11½ by 36 inches interior dimensions through the tunnel, and back of the masonry by branch boxes 10 inches by 12 inches interior. With a pressure of 85 pounds in the boiler this drum made 560 revolutions. Before it was put in, a number of men had been prostrated while working behind the arch.

After the concrete had been in thirty days, the brick arch and sidewalls were taken out; the 50 feet of stone arching being in excellent condition was not touched. The result is a tunnel with many unique features and engineers may well be impatient to learn how the concrete arch will hold.

IMPROVEMENTS IN THE TREATMENT OF ALKALI WASTE.

The apparatus which we illustrate is for an improved method of treatment of black ash and alkali waste to obtain sulphureted hydrogen, sulphur and cement, and is the invention of Messrs. James and John Hargreaves and T. Robinson, of Widness, England. It is a combination of black-ash iron lixiviating tanks and of carbonators, the two operations being carried out in the one vessel. The black ash is supported on mov-

Fig. 1.

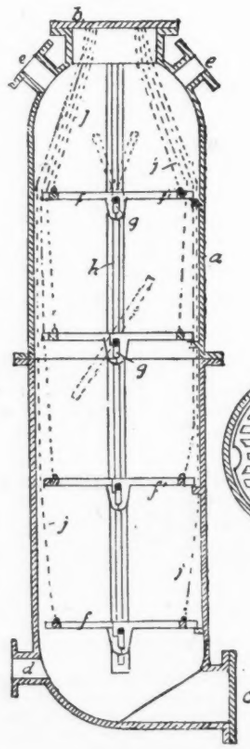
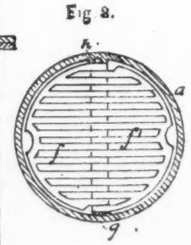


Fig 2.



able perforated grids, by which means both the lixiviation and the carbonation are facilitated. In Figs. 1 and 2 *a* is the vessel, *b* the charging door, *c* the discharging door, *d* inlet for gas, and *e* exit for gas, *f f* grids supported on bars *g*, which work in grooves *h*; the grids can be raised or

lowered by the chains *j*. Instead of grids perforated plates may be employed.

The vessels can also be arranged in varying series, or entirely isolated. Sufficient Na_2O, from about 1½ to 2½ per cent., is left in the black ash to dissolve out at the proper time the various sulphur compounds. Carbonic acid at a pressure of about ten pounds per square inch is forced in through the alkali waste, which is kept moist. When strong sulphureted hydrogen is required, the inert gases are allowed to escape into the atmosphere; when, on the other hand, dilute sulphureted hydrogen is to be utilized for the production of sulphur or sulphurous acid, then this and the air to be supplied to it are first heated before combination. The heat evolved in the act of combustion is employed for heating the gases as above to a temperature of about 400 degrees F. Heated air is now blown in to oxidize the residual sulphur compounds; then water added and steam injected to heat the paste thus formed. The sodium carbonate is causticised and the sulphur dissolved out. The residual carbonate of lime is mixed with clay and converted into cement.—*Jour. Soc. Chem. Ind.*

THE MINERAL OUTPUT ABROAD.

The *Statistical Abstract* for the principal European and other foreign countries in each year from 1878 to 1887-8 has just been published, and among a mass of valuable information are giving some interesting particulars with reference to the progress of the foreign mineral industries. It appears that the total production of the mines throughout the German Empire, including Luxemburg, has steadily advanced from 37,689,300 tons, of £11,247,000 value in 1868, to a total of 95,866,200 tons, of £24,735,000 value in the year 1888. Of this quantity coal figures as 25,704,800 tons in 1868, as against 65,386,100 tons in 1888; peat has advanced from 7,174,400 tons to 16,574,000 tons; iron ore from 3,634,300 tons to 10,664,300 tons; zinc ore from 369,900 tons to 667,800 tons; lead ore from 95,300 tons to 161,800 tons; and copper ore from 201,700 tons to 530,900 tons. The mineral output of Belgium is given for twelve years from 1877 to 1888. In 1877 coal was raised to the extent of 13,669,077 tonnes (2,204 pounds), of 150,584,442 fr. value, and in 1888 the total reached 19,218,481 tonnes, of 162,018,000 fr. value. Iron ore diminished in output from 234,127 tonnes in 1877 to 185,542 tonnes in 1888; lead ore (galena) decreased from 11,542 tonnes to 414 tonnes only, while manganese ore, which was not produced in 1877, reached a total output of 27,787 tonnes in 1888; zinc blende, 26,310 tonnes; zinc calamine, 18,677 tonnes, and iron pyrites 26,107 tonnes in 1877 declined in 1888 to 12,370 tonnes, 12,167 tonnes and 3,916 tonnes respectively. The coal output of France in 1873 (including lignite) was 17,479,341 tonnes, valued at 290,367,799 fr., and in 1887 21,287,589 tonnes of 226,372,029 fr. value. In 1888 22,603,000 tonnes were raised. Comparing the years 1873 and 1887 it appears that iron ore declined from 3,051,124 tons in the former year to 2,579,465 tons in the latter period; iron pyrites advanced from 161,659 tons to 209,253 tons; lead and silver ore from 9,865 tons to 17,436 tons; salt from 627,176 tons to 823,950 tons; pig iron from 1,381,626 tons to 1,567,622 tons in 1887 and 1,683,349 tons in 1888. Peat in 1873 was produced to the extent of 324,092 tons, as against 204,798 tons in 1887. Statistics for three years —1885-1887—are given of the Italian mining industry, from which it is shown that in 1885, the production of the 41 iron ore mines, at which 1,659 men were employed, was 200,955 tons of 2,125,286 lire value, as compared with 209,082 tonnes, valued at 2,292,454 lire in 1886 when 1,683 men were employed. In 1887 only 36 mines were worked, but employment was given to 1,809 men, and 230,575 tonnes of 2,527,652 lire value were raised. In 1885 190 413 tonnes of coal, lignite, etc., valued at 1,507,801 lire were produced at 23 mines by 1,821 men, as against 243,325 tonnes of 1,803,750 lier value in 1886 from 24 mines employing 2,629 men. In 1887 32 mines were worked by 2,870 men and produced 327,665 tonnes of 2,502.860 lire value. The total value of the mineral produce of Austria (proper) in the year 1876 was £3,458,000, which in 1888 increased to £4,497,000. In 1876 the output included 45,612 centners (110 lb.) of copper ore, 5,549,656 centners of iron ore, 76,625 centners of lead ore, 264,577 centners of zinc ore, 67,817 centners of manganese ore, 69,396,184 centners of peat, and 49,284,494 centners of coal. Compared with 1888, the outputs (with the exception of zinc and manganese ore) show considerable augmentation, the totals for the latter year being as follow: Copper ore, 66,184 centners; iron ore, 10,093,203 centners; lead ore, 125,311 centners; zinc ore, 263,120 centners; manganese ore, 65,541 centners; peat, 128,602,553 centners, and coal, 82,744,609 centners.

SEEING BY ELECTRICITY.

It said to be possible that modern electricians may succeed in constructing a device that will do for the sense of sight what the telephone does for the sense of hearing; but the prospects of such an achievement are not particularly bright. The possibility has been demonstrated experimentally, but the practical difficulties in the way of carrying out the idea are very great.

It is well known that certain salts of copper and silver, for example, generate electric currents when exposed to the light, and, conversely, electric currents will produce in these salts changes corresponding to those made by light. If a strongly illuminated object is placed in front of a transmitter covered with such a salt, electrical currents will be generated which will vary in intensity according to the intensity of the light falling on different parts of the surface. If, now, these various currents were carried to a receiver similar to the transmitter, they would produce on its surface changes like those wrought by light on the surface of the transmitter.

Another apparatus has been proposed, based upon the property peculiar to selenium that its electrical resistance changes with the intensity of light. For a transmitter the selenium cells are arranged in squares, like a checker-board. The greater the number the more efficient would the apparatus be. Each of these is connected with an electro-magnet in the receiver. The latter is composed of a mirror constructed of thin strips of steel, to each of which several of the electro-magnets are attached. A strongly illuminated body being placed in front of the selenium transmitter, the electrical resistance of the various cells varies according to the intensity of the light, as in the case of the salts of copper and silver. The various currents affect the electro-magnets in different degrees, the result being that the strips of steel are bent irregularly, turning the mirror into an aggregation of surfaces, very slightly warped, which will throw an image on a screen.

The main difficulty in the way of the realization of such an idea as seeing by electricity lies in the necessary complexity of an apparatus which shall enable innumerable points in the transmitters and receivers to be actuated simultaneously in perfect independence and also in perfect correspondence; but it is quite possible that further experiment will bring into actual use what might be something more than a mere plaything. In defensive warfare a telescope of indefinite length would certainly be of value. With buried wires and concealed visors a general might watch his adversary's movements at times when this would mean victory instead of defeat.—*Electrical World.*

ABORIGINAL CARPENTRY.

In Speaking of ancient American tools, Mr. H. F. McLeod, of the Smithsonian Institute at Washington, recently said: "Aboriginal carpentry was the chief trade of our predecessors on this continent. The Indians and the mound builders had a very good idea of wood-working. You will see even now some very pretty joining done by Sioux Indians. Their tent poles make a fit which many a white carpenter would not like to try to better.

"The best carpenters, of course, were the Aztecs, who had arrived at quite a high stage of art, and whose tools, although they knew nothing of steel, are really excellent. We have a few of their tools at the Smithsonian, but the best collection is, of course, in the City of Mexico. The material used was almost wholly glass, especially for the finer parts of their wood cutting. To chop trees they used flint axes, and for the rough hewing out of logs the same, but when it came to the accurate fitting in of the hewn timber, they handled glass knives, chisels and saws very deftly and with beautiful results. There is a ceaba wood post in Washington with hieroglyphics and faces cut upon it all with glass. You can see bits of the original chisel still sticking in a corner of the wood, where it broke off three centuries ago under the hand of the workman. The Aztecs knew how to make a very good and manageable glass, and their best cutting blades, swords, daggers and spears, saws, chisels and axes, were made of it. When the edge dulled they broke it from the end instead of sharpening it, and got a new cutting line.

"You can see a great deal of aboriginal carpentry still in use among the Moqui Indians of the United States. Of course they use our tools now, but they follow their old patterns. They know how to make ladders, and they swing their doors on hinges from the top, and they know how to mortise timbers—knew how long before Columbus landed in America. Of course they use our tools differently from our way. The chisel they push rather than hammer, and they work the board up and down on a fixed saw rather than the saw on the board, and withal they get creditable results. The frame work in the Pueblos is quite as honest as anything we have in America."

PREMIUMS FOR INVENTORS.

The Verein deutscher Eisenbahn-Verwaltungen has offered nine premiums, of a total value of 30,000 marks, for inventions and improvements relating to (1) the construction and mechanical arrangement of railways (three prizes of 7,500, 3,000 and 1,500 marks respectively); (2) rolling stock and its maintenance (three prizes of 7,500, 3,000, and 1,500 marks); (3) the administration and working of railway and railway statistics, as well as important works on railway (three prizes of 3,000, 1,500, and 1,500 marks). Without restricting the scope of the competition, and without binding the jury in its decisions, it is recommended that competitors should confine themselves to the following subjects: (1) Design and construction of a locomotive boiler which, without increasing its weight, affords safety against explosion, and reduces, at the same time, working expenses; (2) improvements in the construction of locomotives, especially the valve motion, whereby a better utilization of the steam may be obtained; (3) proposal and justification of a simpler means of calculating truck hire; (4) the construction of a durable and practicable coupling for steam pipes or continuous brakes, without the use of indiarubber; (5) the construction of a practical and cheap switch break. The competition is limited to inventions and improvements covering the period of eight years extending from July 16th, 1883, to July 15th, 1891, and works and drawings must be sent in between January 1st and July 15th, 1891, to the Verwaltung des Vereins deutscher Eisenbahn-Verwaltungen, Bahnhofstrasse 3, Berlin, S. W., from which complete copies of the regulations governing the completion may be obtained.

French Enterprise in Chili.—The monopoly which French engineers have lately established in regard to important contracts from Chili is a somewhat remarkable fact. The Mediterranean Forge and Shipyard Company has still under execution the order for four Chilian war-vessels, and the Creusot Works has received numerous orders for engineering and military material from the same market. In addition, the firm of Recope & Laffon has now just obtained a Chilian order for the manufacture of 88 lighthouse lanterns.

New War Ships.—The navy department has issued a circular inviting proposals for building three 8,500-ton coast battle ships to cost, exclusive of armament, not more than $4,000,000 each, the term armament including besides guns and ammunition, all armor of the turrets, barbettes, gun shields and armored tubes directly pertaining to the protection of the guns and loading positions, all parts of the vessels to be of domestic manufacture. Proposals may be under two classes: For the construction of the whole vessel according to the department plans and specifications, and for the construction of either the hulls or machinery or both, according to plans and specifications to be submitted by the bidder.

An Aid in Coke Drawing.—W. H. Dinsmore, a blacksmith employed by the Connellsville Machine and Car Company, has just patented a clever, but simple, invention, intended to be used for drawing coke from ovens, which materially lessens the labor of the drawer and is a saving in tools for the operator. It is a very useful contrivance, and is already coming into general use. A concise description of the device is as follows: An iron bar is placed in position across the door frame of the oven. From

the center is suspended a chain with a swivel link on the end, to which is attached a pulley wheel. The scraper, with which the coke is drawn, is run through the pulley wheel, and thus the heavy weight of the scraper is taken from the drawer's arm. Scrapers are usually worn out in from four to six months, besides destroying much of the oven bottom. By the use of Dinsmores invention the irregular scraping on the oven bottom will be overcome and a considerable saving effected for the operator.

Belgian Metallurgical Industry.—The quantity of iron made in Belgium last year was 620,054 tons, as compared with 547,818 tons in 1888, 534,056 tons in 1887, 470,255 tons in 1886, 469,249 tons in 1885, 471,040 tons in 1884, 478,226 tons in 1883, 503,113 tons in 1882, and 479,807 tons in 1881. It will be seen on comparing the output of 1889 with that of 1881, that the production of iron increased during the last nine years to the extent of 140,247 tons. The average price obtained for the iron made in Belgium last year was £5 8s. per ton. The highest average price obtained during the last ten years was secured in 1882, when it amounted to £6 13s. 5d. per ton, while the lowest average price was touched in 1887, when it stood at £4 15s. 3d. per ton. The production of steel in Belgium last year was 236,186 tons, as compared with 185,417 tons in 1888, 191,445 tons in 1887, 137,771 tons in 1886, 125,461 tons in 1885, 153,999 tons in 1884, 156,301 tons in 1883, 151,291 tons in 1882, and 119,237 tons in 1881.—*Engineering.*

International Congress on Inland Navigation.—Progress is being made with the arrangements for the fourth International Congress on Inland Navigation, to be held in Manchester, England, on the 28th of July and following days. The objects of the conference are to promote the improvement of inland navigation and of estuaries, to direct attention to the economical value of navigable waterways, to examine generally technical questions relating to the construction and working of canals, to receive the report of the International Statistical Commission appointed at the last Congress, and to take further steps toward the collection of statistics bearing on inland navigation. The three previous congresses were held respectively in Brussels, Vienna, and Frankfort-on-Main, and they were attended by delegates appointed by the governments of the countries represented. It is intended to have on view numerous plans, maps, and models relating to inland navigation.

New York State Labor Statistics.—From the seventh annual report of the New York State Bureau of Statistics of Labor it appears that the total number of strikes for five years—1885–89—was 9,384. Of this number 4,432 were successful, 1,434 partly successful, 3,468 unsuccessful, and 50 pending. The number of persons engaged in these strikes was 338,019. The amount lost in wages was $8,042,915.59. The cost to labor organizations by reason of strike benefits and conduct of strikes was $1,210,260.53. The loss to employers from all causes was $5,157,942.15. Of 7,764 strike cases reported for the years 1886–89 inclusive, the settlement has been effected in 46 cases by arbitration; in 291 cases by conciliation; in 426 by conciliation with employees; in 2,758 by conciliation with labor organization: and in 82 no formal settlement; 1,846 were abandoned; 2,315 no return. When the cause of strikes was a demand for more pay, 8,202 establishments were subjected to a demand. Increase was conceded in 2,205 cases; a decrease took effect in 183 establishments. There was no change in 2,813 cases.

American-Built Cars for Europe.—The Jackson & Sharp Works, at Wilmington, Del., are building passenger cars for the railways in France, Spain and Austria. Mr. William Voss, writing about the cars after a visit to the works, says: They are a curious mixture of European and American practice, and are built according to complete sets of drawings sent over. Of course it is sectional work, like that sent to South America. These cars are about 50 feet long, some of them day coaches and others of the Mann boudoir style of sleeper. They have combination wood and iron sills, *bogie* trucks, the old country draw hook and buffers, etc. All the heater and water pipes are of copper, windows run in brass guides (a very good but expensive thing). There is a vestibule at each end, but they do not touch like ours, being about four feet apart when coupled, and iron aprons and railings form the bridge. The entrance is through the vestibule and steps like ours, but *different*. The exterior is mahogany, natural wood finish. Roof much like ours, and is covered with canvas and sheet copper on ends and at eaves. Some of the cars have been shipped, six or 12 more are almost done, and a lot of six is just being erected.—*National Car and Locomotive Builder.*

Miners' Wages on the Continent.—Messrs. Boyle and Young, two of the British delegates at the recent congress at Jolimont, have issued a report to the members of the Northumberland Miners' Mutual Confident Association, in which are stated the rates of wages paid at the various Continental centers. The Belgian report showed that in the central district, the average wage for hewers for a day of from ten to eleven hours, is about 2s. 9d. The hewer's wage in the Charleroi district for ten hours' work is about 3s. 9d. per day. Loaders or trammers earn from 1s. 6d. to 2s. 11d., and assistants from 1s. 3d. to 1s. 4d. per day. In Germany the working day is one of ten hours; the average wage for hewers is about 3s. per day. Much overtime is worked by the miners, who, it was stated, often remained in the mine as many as sixteen and even twenty-four hours at a time. The wage for hewers in the north of France for ten hours' work was said to be from 3s. 2d. to 3s. 4d. per day, and a pension of 10s. per month was given when a man reached the age of 70. In the Pas-de-Calais district there are 28,000 miners employed, the average wage for hewers in this district at present is 4s. 6d. per day. The delegate from the district of the Loire stated that the average wages for hewers in that district was from 4s. 2d. to 5s. per day of 11 hours. The workman, he said, paid back to the company 3 per cent. from their wages to form a pension fund, out of which they received 10d. per day when off work from sickness or accident, and 10s. per month as pension when they reached the age of 55, provided they had worked as a miner for a period of 35 years. The delegate from Bohemia stated that in Bohemia the miners worked 12 hours per day, though as many as 24 were worked when coal was wanted. The wage varied from 50s. to 58s. 4d. per month.

Electric Drills at the Brooklyn Navy Yard.—In the construction of a modern iron ship an enormous number of holes must be drilled through plates varying in thickness from half an inch to 1½ inches, and sometimes thicker, often in very inconvenient positions and under such conditions that the work must be done at a decided disadvantage. Such, for example, is the case on board the monitor "Miantonomah" in the Brooklyn Navy Yard, now being rapidly completed, where a vast amount of drilling has to be done around the turrets intended for the great 10-inch rifles, and perhaps from the interior of the turret and in a position where the use of a power drill for the purpose would seem well nigh impossible.

The box containing the electric drill is about 18 inches long over all, and bears beside the motor only a reel of wire for connecting with the source of power and the flexible shaft that operates the drill. Once clamped in position, the motor, which in the case referred to runs 2,800 turns per minute, but is geared down to comparatively low speed, does its work with great efficiency and an inch hole can be drilled through half-inch iron in less than 30 seconds, while a couple of men handling the machine can accomplish an amount of work that appears prodigious to one who is used to the clumsy hand methods of drilling or the steam power drills that require elaborate setting up, and are exceedingly inconvenient to move around. The reduction of speed by gearing is necessarily great, but is accomplished with comparatively little noise and wear, and the flexible shaft, six or eight feet in length, which connects the motor with the drill proper, enables the drill to be used in the most contracted positions.

Electric Power vs. Steam Power for Small Plants.—The electric motor is probably the simplest and most compact piece of machinery ever made for producing power. As much as 25 horse-power of apparatus can be set up in a space less than five feet square, and where minimum of space is a desideratum this is an important point. There is only one moving part in the machine, *i. e.* the armature, and only one set of bearings. The wear is entirely confined to the one set of babbitt shells, the commutator and the brushes, all of which form but a small part of the total cost of the machine, and all of which can be renewed when worn out, at a comparatively small cost. When this minimum of moving parts is compared with the number of levers, valves, rods, etc., required by a steam engine, and the necessary accompanying wear and tear, the reason for the low repair account of the electric motor, is manifest.

All the work which was formerly done by a steam engine in the printing department of Thurber, Whyland & Company is now performed by a Sprague electric motor. According to Mr. F. B. Thurber all the work is now done in a more satisfactory and less expensive way than when steam power was used.

The space taken up by the motor is considerably less than that by the engine. In addition to this the attendance required by an electric motor is very much less than that required by a steam engine, being in general confined to a few minutes' attention each day, while the steam engine requires, while in operation, the constant attention of a skilled engineer. The following comparison of a few points of a steam engine and a Sprague electric motor, each of ten horse power capacity, is interesting as showing the greater simplicity and economy of the electric machine:

	Motor.	Steam engine
Number of moving parts	1	9
" wearing "	5	20
Floor space (square inches)	8¾	36
Room occupied (cubic feet)	16	216
Percentage of mechanical friction	1	30
Actual H. P. percentage of indicated horse power	100	80
Quarts of oil used per week	¼	12

Dry Air Refrigerating Apparatus Without Machinery.—The increasing importation of foreign meat to England has resulted in the invention of a number of refrigerating appliances, and on Wednesday, on the invitation of the proprietors, a number of gentlemen inspected Hill's patent system of dry air refrigerating apparatus, which is on view at the working dairy at the Royal Military Exhibition, Chelsea, and at the offices of the company, 114 Cannon street, London. The distinctive feature is that no machinery is in use, the cold air being produced from the distillation of ammonia gas, a principle which is not by any means new. The apparatus consists of steam generator, ammonia boiler, separator and condenser for producing cold, and a refrigerator or cold chamber. This chamber is constructed in most cases of a double casing of wood, lined with charcoal as a non-conductor, and the roof is formed by a tank containing a bath of chloride of calcium liquor in sufficient quantity to store up the cold as produced. In the case of the apparatus exhibited at Cannon street on Wednesday, the chamber was 7 feet by 9 feet by 7 feet high, and the ammonia boiler 2 feet diameter by 10 feet long. The solution of ammonia in the boiler is heated by steam from any boiler, or from a specially constructed slow combustion stove, with a spiral coil giving large heating surface. Alongside it is placed a water separator for drying the steam which passes to a boiler three-fourths filled with a solution of ammonia. To this the steam entering by several pipes imparts heat, driving the ammonia into the form of gas. Above the boiler is placed a separator for taking off water carried forward in the distillation of the ammoniacal gas. The water thus separated passes by gravitation to the boiler. Alongside it is a corresponding cylindrical vessel into which the dried ammonical gas passes, and there it is condensed by its own accumulation of pressure and the latent heat carried off by the circulation of cooling water. This liquid anhydrous ammonia flows into the refrigerators suspended in the tank forming the roof of the cooling chamber. The pressure is then rapidly reduced by opening a communication with a separate chamber, and the sudden evaporation of the liquid anhydrous ammonia takes place at the expense of the sensible heat in the cold storage bath in the tank, which therefore becomes very cold and draws heat from the chamber in which the meat is stored. The bottom of the tank is corrugated, which gives a large increase in the cooling area, and to the lower angles of the corrugation gutters are suspended carrying off the water, so that the atmosphere is dried as well as cooled. On Wednesday the temperature, after the doors of the chamber were closed, was reduced in comparatively short time by about 40 degrees to 39 degrees. Recently it was tested from the evening of June 14th to the morning of the 20th, and it is said that the temperature of the liquid in the tank rose in that time from 16½ degrees to 31 degrees; the fall of temperature in the chamber being from 52 degrees to 36¾ degrees, while in the office in which the chamber was placed the fall was from 65 degrees to 61 degrees.—*Engineering.*

PERSONAL.

Mr. D. M. Harr, of Fairmont, West Va., appointed mine inspector by Governor Fleming, of West Virginia, took charge of the office July 1.

Mr. Charles A. Hamilton, of Bridgeport, has been appointed treasurer during the absence of Col. Fred. A. Mason, of the Bridgeport Brass Company.

Mr. J. A. Macpherson, president of the Rappahannock Gold Mining Company, has returned from a visit of inspection of the company's property in Stafford County, Va.

OBITUARY.

Mr. William M. Davidson, senior partner of the coal firm of William M. Davidson & Co., died on Wednesday last in the sixty-third year of his age.

A. L. Spalding, a coal dealer of Lockport, N. Y., committed suicide on the 4th inst. He had been ill for several weeks, and it is thought that mental aberration followed.

Samuel Budd Sexton died on the 3d inst. in Baltimore, Md., in the 80th year of his age. He was born in New Jersey, and in 1838 removed to Baltimore, where he engaged in the manufacture of stoves. Later, he entered the foundry business, and in 1889 rebuilt his works from 511 to 521 West Conway street. Mr. Sexton was the originator and patentee of the "Baltimore fireplace heaters."

John G. Nottinger, one of the oldest settlers of La Salle County, Ill., died at his home in Ottawa, Ill., on the 8th inst. of old age. He was 82 years old and first settled in that county in the forties. He was one of the first men to develop the coal fields at Streator. He was one of the heavy stockholders in the Vermillion Coal Company for many years, and in 1859 was one of the directors of the Fox River Valley Railroad.

James A. Richards died on the 5th inst., at South Chester, Pa., on the eve of his 64th birthday. He was born in Oley Township, Berks County, Pa., and was for many years prominently identified with the early iron industries of Eastern Pennsylvania. In 1852 he went to Columbus and built the old Shawnee rolling mill, one of the first merchant and bar iron mills in the State. In 1872 and '73 he built the Lochiel blast furnace at Harrisburg. He was engaged for many years in successful prospecting for and mining iron ore in York, Adams, Franklin and Cumberland Counties, Pa., and in the iron ore districts of Southwest Missouri.

Sir Warington W. Smyth, M. A., F. R. S., who died on the 29th ult., was the eldest son of Admiral W. H. Smyth, D. C. L., F. R. S., etc., and was born in 1817 at Naples. He was educated at Westminster and Bedford Schools and Trinity College, Cambridge. He was appointed to a post on the Geological Survey, and in 1851, on the formation of the Royal School of Mines in Jermyn Street, he became lecturer on mineralogy and on mining, retaining the former chair till 1881 and the latter to his death. About the same time he was appointed inspector of the mineral property of the duchy of Cornwall, and soon afterwards chief mineral inspector to the crown, under the Commissioners of Woods, Forests and Land Revenues. For the Geological Society he has done good service, having been one of the honorary secretaries from 1856 to 1866, president in 1866 and 1867, and foreign secretary for the last 16 years. In 1879 he was appointed chairman of the Royal Commission on Accidents in Coal Mines, to the duties of which office he devoted much labor, in addition to the performance of his ordinary professional work during the seven years in which the commission was sitting. For this and other public services he received the honor of knighthood in 1887. Beside various technical reports and contributions to purely scientific literature, he published in 1856 a book entitled *A Year with the Turks*, and in 1867 *A Rudimentary Treatise on Coal and Coal Mining*, a standard work now in its sixth edition, which has been translated into the principal languages.

INDUSTRIAL NOTES.

A mortgage of the Thomas Iron Company, given to the Farmers' Loan and Trust Company, has been placed on record. It was given for the purpose of retiring the 7 per cent. first mortgage bonds, amounting to $400,000.

The steamer "Iron King" and a portion of the Columbus & Hocking Coal Company's dock at Ashland, Wis., were burned on the 4th inst. Three firemen lost their lives and four others were injured. The loss is placed at $150,000.

The last monthly pay roll of the Pennsylvania Steel Company, at Steelton, Pa., included 3,957 workmen, to whom were paid $154,000. The first pay by the two weeks' system, which included the first 15 days of June, amounted to $72,000.

The Allentown Iron Company has only stack No. 4 in blast at present. No. 5 was blown out recently, and will be given an overhauling. The pipes for the new hot blast are being erected. No. 1 will be ready to go into blast in two or three weeks.

A Corliss engine of 3,500 horse power is being placed in the Homestead Steel Works, Pittsburg, Pa. The by-wheel will weigh 2,000,000 pounds and the whole thing about 500,000. The engine will have a horizontal cylinder 54 by 72 inches. This is one of the largest stationary engines in the world.

The York Iron Company has shut down the furnace of Black River Falls, Wis., to make needed repairs. The furnace has been running but eight months since the general repairs, and it was expected to run a year and a half. The cost will be $1,000 and it will take two months' time to get the plant ready to fire up.

It is said that a great deal of dissatisfaction prevails among the employés of the rod mill connected with the Iowa Barb Wire Works at Allentown, Pa., on account of their employers' failure to sign the scale of the Amalgamated Federation of Steel and Iron Works. So great has been their disgust that many of them have left for their former homes.

A special dispatch from Findlay, O., says: "The Salem Wire Nail Mills, of this city, giving employment to 500 hands, shut down yesterday, pending the adjustment of a wage scale, growing out of the fact of the employés having joined the Amalgamated Association of Iron and Steel Workers, and the new scale of wages is unsatisfactory to nail manufacturers."

The Logon Iron & Steel Company, of Lewiston, Pa., has put its two furnaces in operation after making repairs. The Lackawanna Iron and Coal Company has all of its furnaces in blast again. The Thomas Iron Company has blown out its No. 10 furnace at Saucon for repairs. The Coplay Iron Company, of Coplay, whose furnaces have been idle the greater part of the last six months, has blown in its No. 3 furnace, lately remodeled.

It is announced that the Illinois Steel Company will make an important change in its Chicago office August 1st. The auditor's office, which has hitherto been in Chicago, will be moved to Joliet. When the Joliet Works ran alone as the Joliet Steel Company the auditor's office was in Chicago. The two offices have been combined, and J. F. Wilson, cashier of the Joliet Works, has been promoted to the position of auditor. The change will remove a large force of clerks to Joliet, and will raise the standing of the Joliet Works. W. R. Stirling, the old auditor, has been made first vice-president.

The old mill of the Bethlehem Iron Company has been busy making structural iron, angles and girders, from 78 to 90 feet in length, which are to be used in the new building now in course of erection at the ordnance plant. No. 1 heating furnace of the steel rail mill of the Bethlehem Iron Company, in charge of Foreman William Maharg, which has been rebuilt, is again in operation and works very satisfactorily. The Bethlehem Foundry and Machine Company's Works are running on full time, seventy-six men being employed at the works. Ellis C. Kent has been elected manager in place of William B. Bomig, resigned, and Jacob H. Jacobson, assistant manager.

A dispatch from Pittsburg, Pa., says that the boiler manufacturers have decided to combat the demands of their men indefinitely, and the men say they will hold out until they are granted the reduction in hours. The strike affects nearly 2,000 men. A lengthy shut down is looked for at the National Tube Works, in McKeesport, Pa. The firm refuses to sign the Amalgamated scale, but is willing to pay union wages. This the men decline to accept, and as a result the plant is idle and about 4,000 men are out of employment. The scale of prices offered by the Amalgamated Association has been signed by the operators of the Pottsville (Pa.) Iron and Steel Works.

All is not clear sailing for the Amalgamated Association of Iron and Steel Workers in their attempt to induce manufacturers east of the Alleghanies to subscribe to the scale of wages recently adopted at Pittsburg. A number of iron manufacturers seem unwilling to sign the wage schedule and adopt the classification of work which the association sent out on July 1. The scale for puddling proposed is $5.50 per ton when the schedule price for bar iron is 2 cents per pound, wages to advance 10 cents per ton for every advance of one-tenth cent per pound in the price of iron. The workers fixed their minimum basis at 2 cents per pound, and no matter how much below that figure iron descends, wages are to remain the same.

Industrial property has come to be of so much importance in recent times that three international conferences for the purpose of securing it have been held in the last few years. The conferences have only advisory power, the governments represented having the right to accept or reject the recommendations made. The Madrid conference, which recently concluded its session, was occupied mainly about three subjects namely, the repression of false indications of the origin of goods, the international registration of trade marks, and certain points regarding the interpretation and application of the principal convention of 1883. Under the first head it was decided that in case of imported goods to be sold under the name of a merchant in the importing country, the true place or country of manufacture must be clearly indicated upon the goods. The conference also declared in favor of international registration of trade marks. The treatment of the last question was found to be a difficult matter, and involved a decided difference of opinion.

CONTRACTING NOTES.

The Berlin Iron Bridge Company, of East Berlin, Conn., has received the contract for the new stock house for the Isabella Furnace at Barneston, Pa., which will be of iron, designed and built by that company. It will be 54 feet in width by 100 feet in length, and arranged so that loaded trains can pass entirely through the building.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

931. About 4,000 barrels Portland cement. Missouri.

934. Artesian well machinery. Florida.

935. A 25 H. P. boiler and engine and a stave mill. Virginia.

936. A 10 × 15 engine and 30 H. P. boiler with return flues. Alabama.

937. 30-inch band saw, swing saw and cut-off saw. Alabama.

938. Machine shop equipment, fire bricks, boilers, blowing engines, hoisting engines, plate iron, and castings for blast furnace. Tennessee.

939. A 10 × 16 cylinder standard gauge saddle tank locomotive, with three drivers. Tennessee.

940. Saw mill, about 50-inch, patent tooth preferred; carriage, about 25 feet long, belt pulley 12 × 26 or 30 inches, ratchet head blocks and sett. Georgia.

941. A second-hand iron tank, not less than one-fourth inch iron, about 8 or 10 feet in diameter and about 8 or 10 feet deep. Pennsylvania.

942. Machinery for electric light and waterworks. Georgia.

943. Second-hand boiler and engine of from 25 to 35 H. P. South Carolina.

944. Full line of planing mill machinery. Tennessee.

945. A 15,000,000 gallon steam pump with all necessary appliances and boilers. Later, other supplies for new water-works. Georgia.

946. Correspondence with manufacturers of castor bean hullers. New York.

947. Information in regard to foundry equipment, cupola, etc. Texas.

948. Everything necessary for a complete system of water-works.

949. A 20 H. P. stationary, tubular boiler, and a 9x10 engine. Kentucky.

950. Correspondence with manufacturers of pipe, stand pipes, pumps, engines and hydrants, for water-works. South Carolina.

951. 1,500 feet 15-inch glazed sewer pipe; 2,000 feet 12-inch sewer pipe; 500 feet 16-inch iron pipe. Georgia.

952. Boiler, 6 to 12 H. P. Georgia.

953. Quotations on ice factory machinery Georgia.

954. Outfit for ice factory, also steam laundry. Georgia.

955. Prices on excelsior machinery. Alabama.

AMERICAN GOODS WANTED ABROAD.

932. Information concerning machinery for shelling castor-oil beans. Mexico.

933. Machinery for grinding up logwood or Brazil wood. Mexico.

956. Prices and particulars of latest improved machinery for large central sugar factories, particularly boilers and centrifugal machines and turbines. Martinique.

957. Estimates for lighting streets of a city of 25,000 inhabitants, where water power can be supplied. Martinique.

958. Correspondence with manufacturers of brown coal or lignite briquette machinery. Australia.

959. Samples and prices of bags for shipping cocoanuts. United States of Colombia.

960. Machinery for extracting cocoanut oil. United States of Colou bia.

961. Catalogue of strong, plain carriages, with seats for two and for four persons. United States of Colombia.

962. Correspondence with manufacturers of glassware, tinware, furniture (chairs specially), lamps and lamp chimneys. West Indies.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including July 2, were as follows:

			Tons. 1890.	Tons. 1889.
Marquette, Marquette District			453,497	518,071
St. Ignace,	"	"	14,919	16,865
Escanaba,	"	"	†439,000	352,040
"	Menominee	"	†634,075	593,863
"	Gogebic	"	†105,249	96,442
Ashland,		"	†720,336	488,146
Two Harbors' Vermillion District			281,935	285,549
Total, tons			2,649,011	2,350,976

† Up to June 25 only.

ALABAMA.

(From our Special Correspondent.)

CLEBURNE COUNTY.

ANNISTON GOLD MINING COMPANY.—This company has very recently been organized for the purpose of working and developing a new gold "find" The officers are William Noble, of Anniston, president; Chas. M. Harper, of Rome, vice-president; E. E. G. Roberts, secretary and treasurer, and W. J. Houston, manager.

ARIZONA.

COCHISE COUNTY.

SILVER KING MINING COMPANY.—The superintendent's report for the week ending June 28th says: "After running 125 feet in the northeast drift of the 980 level, I find that the vein matter is bearing more to the north, and on the 23d I came back 75 feet from the face of the drift, and am running in a more northerly direction, as I want to keep in the porphyry belt, and the stringers of quartz that have given assays are apparently running that way. Number of feet from the drift coming in from the Bilk shaft to the face, 63 feet. Advanced 13 feet. A force of four miners is employed.

The new drift on the 1,100 level is in very hard quartz, and consequently we are making slow progress. The rock looks well, and looks as if it ought to contain mineral, but by assaying it does not show any. Total length, 37 feet; advanced, 13 feet; force of miners, 4.

The cross cut on the 1,400 level going out from the station is in porphyry but it is not very hard After crossing this porphyry if we do not find anything I will then run a drift from this cross cut off to the west. Total length from winze, 95 feet. From station, 80 feet. Advanced, 24 feet. Force of miners, 5."

MARICOPA COUNTY.

MESHACERTY MINING COMPANY.—The first meeting of the subscribers of this company (see ENGINEERING AND MINING JOURNAL, May 24) was held on the 10th inst. An application was filed for incorporation under the laws of West Virginia, of a company with a capital stock of 500,000 shares at $1 each, full paid and not assessible. The incorporators are Stephen F. Mack, Horace M. Hibbard, Augustus W. Peters, Wm. H. Olmsted and Henry Chaurant.

CALIFORNIA.

AMADOR COUNTY.

PLYMOUTH CONSOLIDATED GOLD MINING COMPANY.—The Superintendent of the company makes the following report: "The drift running south starts on No. 2 level with a cross cut west from the shaft about 130 feet, at which latter point the vein matter is cut, thence it runs south on foot wall 1,010 feet to end of drift. Seven hundred feet south from where the vein matter is cut by cross cut from the shaft, cross cut No. 1 east was started, which, at a distance 112 feet from the main drift, cut a ledge which is five feet thick in the bottom of the drift, and seven feet in the top. On this vein they run north 25 feet, which appears to be the north end of the ore shute. They have run south on ore 50 feet. At this point the vein is five feet thick, the ore is good, and will mill from $10 to $12 per ton. Ten feet north of this point there was a break in the vein, and apparently it was the end of the quartz, but, by breaking in east it is found that the ore continues. Three hundred feet south of cross cut No. 1, cross cut No. 2 was started, which was run east 183 feet when it cut ore that is two feet thick in the bottom of the drift, and three and one-half feet in the top. The ore at this point will mill from $5 to $6 per ton—so it is, without doubt, an ore shute 300 feet or more in length, of an average width of probably five or six feet, which, I think, is safe to calculate will mill $10 per ton. This being entirely new ground, and a long ore shute of good healthy looking quartz, carrying free gold and a fair per cent. of iron, it will no doubt extend up nearly to the surface, and, as it appears, will increase in width very much as it goes up, and will probably extend down several hundred feet. It must be an extensive body of ore. As there is no regular hanging wall to this vein, I think there must be another body of ore east of this. I presume a cross-cut further east will, in the near future, be made, to demonstrate whether there is still another body of ore east or not. It looks now as though the old mine had taken a new lease of life, with a good prospect of many future dividends. On No. 3 level, at a point about 450 feet north of the shaft, a cross-cut has been run east, 56 feet, where it cut a vein of low grade ore some 20 feet thick. This shute of ore is 120 feet long on the tunnel level. In the stope, some 40 feet above tunnel level, it is not quite as long. From this vein the most ore is taken that supplies the 40 stamps that are now running. Mr. Crain reports the ditches all in good order, and thinks there will be no time this season that the water can all be taken into the ditches, so there will be no lack of water this season. There is on hand an abundant supply of timbers and lagging."

(From our Special Correspondent.)

MONO COUNTY.

BODIE DISTRICT, Bodie, June 28.

STANDARD CONSOLIDATED GOLD MINING COMPANY.—The Standard is about to start its stamps again, and business is generally improving; but the permanent prosperity of Bodie depends on making the low grade ores available, a desideratum which, to be realized, requires a tunnel from Mono Flat, the introduction of electric power, etc.

HOMER DISTRICT.

Clifton, Colhamer, Golden Prince, Jackson, and a few more are each working a few men prospecting, and getting out some gold ore.

May Lundy is working a few men on a lease.

JORDON DISTRICT.

In this district the Illinois is running a tunnel to tap the lode. The Paraclete has a tunnel ready with plenty of ore, three distinct fissure lodes, one of gold and silver, one of copper and one of iron, but a lawsuit about the iron lode delays large operations.

Rattlesnake, an old mine that has some very rich ore, is also tied up with lawsuits.

PATTERSON DISTRICT.

A Chicago Company is running a long tunnel to tap a silver lode.

TIOGA DISTRICT.

The Great Sierra is having the telegraph and roads fixed. This company has spent a large sum of money in developing and getting patents for these mines. One mine, Sheep-herder, owned by Mr Swift of New Bedford, has a tunnel nearly 1,800 feet long, in which the ore is all silver. At Mount Gibbs, the Ella Bloss, Golden Crown and several other silver mines are being prospected.

COLORADO.

COLORADO COAL AND IRON COMPANY.—A despatch from Boston says that negotiations are pending, and it is believed they will be consummated, whereby this company will contract with the Crescent and Catalpa companies for their entire output of iron ore for one year. It is said the Catalpa has $45,000 cash on hand.

GUNNISON COUNTY.

A dispatch from Tincup has been going the rounds of the daily press, and purports to tell of a wonderful discovery of gold. The find is six miles from Tincup, on Cross Mountain, and is owned by McCormick & Lewis. Between the two lines there is 10 feet in thickness—the lower six feet iron manganese, the upper four gold-bearing quartz of free gold. The lowest assay from this rock is $440 per ton, and there are specimens which, put through a common mortar, return $20,000 in gold to the ton.

LAKE COUNTY.

CONTINENTAL CHIEF.—An entire new plant of machinery has been ordered for this mine. It is reported that there is over $1,000,000 worth of mineral in sight, and development work has now fairly begun. In everystope and drift large quantities of mineral are exposed to view.

IRON SILVER MINING COMPANY.—This company has leased all its properties except the Moyer. This is considered a good move, as new energy will now he used in pushing their claims to the front.

SMALL HOPES COMPANY.—From the recently published report of the president of the Small Hopes Consolidated Mining Company it appears that the total amount received during the year from the sales was $130,390.28; outlays, including much development work, $121,086.64, leaving a profit of $9,303.64.

The ore was chiefly from and under the old stopes of the Forest City claim, and averaged $32\frac{16}{100}$ ounces per ton. It is thought that all of the older parts of the mine will pay for reworking. No extensive new ore bodies have been opened. The McCormick shaft, from which much was expected, was sunk to a depth of 504 feet, and upward of 3,339 feet of drifts, winzes and raises have been opened. The vein matter through this prospected territory has been strong, averaging 30 feet in thickness, but it contains very little silver. A diamond drill hole was bored from the bottom of the McCormick shaft, 448 feet, and penetrated the white limestone to a depth of 66 feet, but no ore of consequence was found.

The "Third Contact Ore Chute," so called, found during the past year on Carbonate Hill, it is thought may extend within the lines of the company's ground, and if it preserves its present grade of ore and extent it would add largely to the value of the property.

SMALL HOPES CONSOLIDATED MINING COMPANY.—There are 60 men employed on this company's property, which is at present giving an output of 35 tons per day.

(From an Our Special Correspondent.)

DOLORES COUNTY.

RICO, July 7.

The Rico mining district, in the southwestern corner of Colorado, is destined to be the scene of the next mining excitement in the Rocky Mountains. Like Aspen, before the advent of the railroads, it discloses a great deal of ore, but the operations of the mines are limited by the want of shipping facilities. At present 20 six yoke ox teams and as many more three-span mule teams, besides a large number of fours are engaged in hauling out ore. A force of 1,500 men is engaged in building a railroad from Dallas to Rico, and a force of 700 to 800 is at work upon a road from Durango. By September 1st it is expected that the Dallas road will operate 20 miles, which with promised additional teams will probably enable the mines to produce more than is extracted in pursuing development work. About 2,000 tons of ore, much of it sacked, the accumulations of spring work when the roads were impassable, is awaiting transportation. So far no impression has been made upon this reserve.

The ores of the district embraced almost every character and class. In tonnage the carbonate of lead mines are ahead, but in values the sulphide mines carry the banner. The carbonate of lead ores are found in channels occupying interstratified veins, the walls of which vary, but being generally blue limestone, with shale or porphyry for the upper roof. All miners familiar with the mining of siver-lead ores in the West, in limestone, are greatly delighted with the promises of the district.

The great producing mines of the district at present are the Enterprise, having nearly $100,000 worth of ore sacked awaiting transportion; the Jumbo mine, the ore of which runs $600 per ton; the Swansea, the Montezuma, Golden Age, Stevens-Union, Forest and Richmond. All of the above are situated on one hill. On an opposite hill are the Cobbler, Grand View, Princeton, Limestone, Pigeon and others. These are all so-called carbonate mines and producers, that with the arrival of a railway will ship from 5 to 50 tons a day. The large bodies of carbonate ores run from 35 to 60 per cent. lead, and 10 to 70 ounces silver. The Limestone recently shipped 100 tons of ore that averaged 58 per cent. lead and 51 ounces silver per ton. The camp next year, it is predicted, will employ 1,000 men underground, which should assure the town of Rico a population of 6,000 to 7,000 people.

OURAY COUNTY.

MT. SNEFFLES, July 6th.

The San Juan mines never before looked as promising as at the present time. In all the districts there is a greatly increased output of the precious-metal-bearing ores. Men who desire to work need not be idle. An unusual number of mills are being put up for the amalgamation and concentration of ores, and in all departments there is increased activity.

MONARCH.—The ore of this property near Virginius is of the same general character as that found in the Virginius. It is not so high in grade, but the pay streak may be a little thicker.

Forty or fifty men are employed on the property

and taking out a large amount of ore. Mount Sneffles is rich in great bodies of argentiferous ores, and one of the most massive and lofty mountains of the San Juan. A wagon road has been built from Ouray up to the Virginius mine, 12,500 feet above the ocean; three or four tons are hauled at one load. On the Virginius a sawmill is operated, and logs are hauled up and cut for timbering of the mine, as the timbers can there be cut just as required.

REVENUE TUNNEL COMPANY.—This company is driving a hole into Mt. Sneffles, designed to cut the Revenue group of veins, the Virginius, Sidney, Terrible, Monarch, Humboldt and other great veins on the mountains. It is now in nearly 2,000 feet, and fifty men are pushing on the work day and night, using the Rand drill with compressor. They are now very near the Revenue group, liable to cut them any day, and thus disclose a large body of ore. The tunnel whose dimensions are 7½ × 8 feet, starts in at the northern base of Mt. Sneffles, and, should it go on through the mountain, will be about three miles in length.

YANKEE BOY MINE.—This property, located on the same mountain, has a good local reputation, and twelve years ago ore from it was sent on the backs of jacks over the mountains, a distance of 15 miles, to Silverton, whence it was freighted by wagon to Del Norte, a hundred miles more, and yet money was made out of it. The company is now putting up a large mill on the property, and the mine is to be worked quite extensively. The ore carries gray copper, ruby silver, some lead, and much of it runs very high in silver. The property is managed by F. M. Endlich, with Mr. Ayers as superintendent, active and capable mining men, who push the work in a commendable manner. It is proposed to have the mill in operation in September.

GEORGIA.

(From our Special Correspondent.)

In view of the recent discoveries of phosphate deposits in Georgia the following extract from the State law will prove interesting:

In 1885 a law was passed to "encourage search for phosphate rock and phosphate deposits by granting to those who find it the right to dig, mine and remove the same in and from the beds and margins of the navigable streams and waters in the State of Georgia."

At the time this law was passed, it attracted but little attention, as no discoveries of any importance had been made, but now those interested in the discoveries are taking advantage of it.

Upon discovering a phosphate bed, the finder files in the office of the Secretary of State a notice of his discovery, with a description of the location, and sufficient evidence to show that he is the finder. The finder now files a bond of $20,000, guaranteeing to make returns and payments according to law, after which upon the payment of a fee of $100, a license is granted to him. This entitles the holder thereof to dig, mine and remove phosphate deposits within a radius of five miles from the point named, provided it does not interfere with private rights. The right is exclusive; if both sides of the navigable stream belong to private citizens the finder is confined to working in the stream, which working shall not obstruct navigation. Any person holding one claim shall not hold another within 20 miles of it; the right is for 10 years. In addition to the license of $100, the holder pays the sum of one dollar ($1) for each ton of phosphate rock dug, mined and removed. Returns of the output are to be made on the first day of October annually, or oftener if required by the State Treasurer.

Several licenses have already been granted to phosphate discoverers of Glynn County.

The Georgia Improvement Company has been organized in New York City under the laws of the State of New York. Its purpose is the development of Georgia mineral lands, and its operations will principally be directed to Lumpkin and White counties.

GLYNN COUNTY.

The recent phosphate discoveries in this county are at present attracting much attention. Near Brunswick a bed was tested that proves to be very good; it is said to have been traced a mile in length and sixty feet in width, while borings to a depth of fifty feet show that the quality improves with depth. Florida parties are contemplating taking the matter in hand and forming a company for working it.

LUMPKIN COUNTY.

BARLOW.—While on a recent visit to this famous property, I was fortunate enough to be there when a rich chute of ore was opened up at a new place where the manager is having prospecting done. It is just up on the hill behind the mill, and near the old works which are being sought for by tunneling in from the hill-side. Three pans of ore gave nearly twenty pennyweights of gold, and every panful shows up well. It is hoped to strike these old workings soon, when it will be given a trial run in the mill.

GRISCOM.—G. M. Stanley, of Jackson, Mich., has purchased this mine with a view to developing and working. It is expected that operations will commence at once.

MCDUFFIE COUNTY.

J. B. SMITH.—This mine is worked only on a small scale and in a tributory way. Since the death of Mr. Smith, some time ago, his widow has carried on the work, but it is very probable that it will not amount to much unless it is taken up by other parties and worked steadily.

WHITE COUNTY.

ST. GEORGE MINING COMPANY.—Arrangements have been made by which this property is to be henceforth known as the Gold Hill Mining Company, and will be operated by a New York company. Forty men are at work on the ditch, after the completion of which a 20-stamp mill is to be erected.

MISSOURI.

(From our special correspondent.)

JASPER COUNTY.

JOPLIN, July 7.

The price of zinc ore is advancing; the average paid during the week ending July 5 was $25.50 per ton. Lead still remains firm at $25 per thousand.

The following are the sales of ore as reported from the different camps for the two weeks ending July 5th:

Joplin mines, 2,567,757 pounds zinc ore and 277,600 lead; value, $39,211.25.

Webb City mines, 1,552,060 pounds zinc ore and 136,290 lead; value, $22,545.12.

Carterville mines, 1,377,280 pounds zinc ore and 61,430 lead; value, $18,515.25.

Zincite mines, 518,530 pounds zinc ore; value $6,727.72.

Lehigh mines, 180,960 pounds zinc ore and 3,660 lead; value $2,445.95.

Oronogo mines, 33,580 pounds zinc ore and 8,720 lead; value, $1,527.

Galena, Kan., mines, 1,521,480 pounds zinc ore and 350,000 lead; value, $25,528.75.

All districts, total value, $116,501.04.

The new zinc-smelting plant for Joplin is now said to be assured, and work will soon be commenced.

The Joplin Electric Street Railway and Motor Company, composed principally of St. Louis capitalists, have purchased the franchise of the Joplin Rapid Transit Electric Railway Company, and will push to speedy completion the plans of the former company, except that in place of single track and switches a double track will be adopted.

Judge O. N. Hilton, of Denver, Colo., and Captain Ijams are in Joplin looking after their mining interests.

Howard M. Holden was in the city on Saturday, and spent the day visiting the mines around Joplin. Mr. Holden is president of the Kansas City Mining Exchange, vice-president of the Board of Trade, president of the Excelsior Springs Company, a director of the Bank of Kansas City, and largely interested in the Standard Mining Company at Aspen, Colo.

J. C. Woodson, the State Mine Inspector, arrived in the city yesterday evening, and will spend a week or ten days in looking over the condition of the mines.

H. B. Paine and Reinmiller & Co. have just closed a sale of 1,000 acres of mineral land located 1½ miles southeast of the city of Joplin to a St. Louis syndicate for $150,000. The land, locally known as the 1,000-acre tract, was owned by the Pichero and the Granby Mining and Smelting Company, and owing to developed lands adjoining is supposed to be rich in lead and zinc ores.

The next most important sale was made by Chas. Matt & Co., of an 80-acre tract of land adjoining the city limits on the east to the Carlotta Land and Improvement Company for $30,000 cash. This tract of land is developed and producing lead and zinc. Matt & Co. also closed a deal of 164 and 519 lots in East Joplin to the College Hill Improvement Company, of which J. C. Stewart, of Webb City, is president, Ben F. Hammett, vice-president, and W. S. Powell, secretary and treasurer, both of St. Louis.

E. B. Leonard and his son James have purchased 4,700 acres of mineral land in Newton County on Lost Creek, lying between Saranac and Dayton.

D. Boaz and other Kansas City parties who recently purchased the John Reoch farm, 2½ miles east of Joplin, are having Holibaugh & Van Ness subdivide the land into mining lots 200 feet square, to be let to miners.

As soon as Mr. Boaz purchased the land he commenced development by sinking a shaft in a grove of timber. He immediately put up a steam hoisting plant, and at a depth of 50 feet opened up a body of lead and zinc ore. Your correspondent has often said that it only seemed to be a question of development in this district to open up a lead and zinc mine, and again I make the prediction that in less than five years' time, if development progresses as rapidly as it has in the past years, almost every farm now cultivated in this district will have a producing lead and zinc mine.

ASTOR MINE.—In three days last week this company mined and sold 30,590 pounds zinc ore.

HENDERSON LAND AND MINING COMPANY.—Professor Walters, president of the Academy of Natural Science of Kansas City, was in Joplin week before last investigating the mineral resources, and, together with other parties, he purchased a tract of 2,923 acres of land at the head of Lost Creek, Newton County. The name given to this company when organized was the Henderson Land and Mining Company.

The Snyder Bros. new plant of machinery, consisting of crusher, rolls, etc., is being put up as fast as possible, and is expected to be in running order by next week.

DIAMOND LEAD AND ZINC COMPANY.—This company has filed articles of association with a capital stock of $100,000. The directors are: J. W. Speas, I. J. Ringolsky and Morton Wollman, of Kansas City, and George Vandermerker, of Leavenworth, Kan. This property has been entirely developed within the past six months and the deepest shaft does not exceed 80 feet, while the average of all the shafts is less than 65 feet.

LEHIGH MINES.

NICKEL PLATE MINE.—This company is running on full time and in good ore; it intends to put on two shifts commencing Monday. S. A. Stuckey & Co. are drilling on the Knight land, east of the town, and have struck a fair prospect of zinc ore.

WHITE ELEPHANT MINE.—This company got out 40,000 pounds zinc ore; the ore is improving.

WILD GOOSE MINE.—This property turned in 13,666 pounds zinc ore last week in four days.

MONTANA.

DEER LODGE COUNTY.

MARIE SILVER MINING COMPANY.—R. S. Francis, C. M. Switzer and L. M. Kennett filed articles of incorporation for this company, with a capital stock of $300,000, divided into shares of the par value of $1 each. The trustees are: S. R. Francis, J. B. McCullough, J. R. Moille, James Hopkins, Phil. M. Saunders, L. M. Kennett and C. M. Switzer. The principal offices will be in New York and St. Louis. The Marie is the outcome of the San Francisco Consolidated Mining Company.

MEAGHER COUNTY.

CASTLE COAL MINING COMPANY.—A company has recently been formed at White Sulphur Springs to develop the Bivins coal field, 16 miles west of that place. The property is at present developed by six tunnels, each of which show up from 1½ to 4 feet of coal. In addition to this there is a large supply of fire clay between the coal measures. The officers of the company are: John Potter, president; Geo. Hailey, vice-president; Hugh Cameron, secretary, and Ed. Bobenreith, superintendent.

SILVER BOW COUNTY.

THE BELLE OF BUTTE.—This mine is situated just a little south of the Clark Fraction on the great Alice lead in Walkerville and the property of the Butte and Boston Company, under the management of Captain Hoatson. A new hoist of the most approved pattern has been erected on this mine. Frank Doyle is the foreman of the works. The shaft has reached at present a depth of 400 feet, but sinking to the 500-foot level is to be resumed. The drifts have shown up a fine body of ore, much of which is said to be covered with the white metal. Most of the ore worked at the Silver Bow mill comes from this property, there being but little sorting to do below, and the ore is hauled off to the mill as fast as it comes to the surface. New chutes have been erected and the mine on the surface has been placed in a good condition.

NEVADA.

It is reported that the Nickel and Cobalt mines, at Cottonwood, have been secured by an English company which proposed to begin immediate development. Recently a rich vein of almost pure nickel is reported to have been struck and machinery is now being purchased in San Francisco for a twenty-five ton smelter. If the government contract for nickel for the Carson mint is secured, it will make the new camp, named Nickel, very lively this summer.

NORTH CAROLINA.

(From our Special Correspondent.)

CHATHAM COUNTY.

NORTH CAROLINA STEEL AND IRON COMPANY.—A typographical error occurred in our issue of the 28th inst., regarding the analysis of the Ore Hill Limonites, reading as follows:

	Per cent.
Metallic iron	33·20
Phosphorus	·0408
Sulphur	·17
Silica	6·58

which should read as follows:

Metallic iron	53·20
Phosphorus	·0408
Sulphur	·17
Silica	6·58

MOORE COUNTY.

KENDALE GOLD MINE.—The manager of this mine, Capt. Wm. Jenkins, has purchased from the Mecklenburg Iron Works a complete mining and milling plant, including the motive power. The mill is to be a 10-stamp mill, though the engine and boiler are capable of supplying power to a 30-stamp mill, in case the company desires in the future to increase their plant.

ROWAN COUNTY.

STONE MOUNTAIN GRANITE COMPANY.—This company has commenced work and has about 25 men at the quarry; a part of the necessary machinery has been purchased and is being put in place, the remainder is to be added at once. It is intended to use the most improved channeling and other machines, with a view to reducing the expenditures as much as is possible in the hope of being able to compete with northern companies, besides doing a local business.

UNION COUNTY.

HOWIE.—In our letter of the 8th ult. (issue of June 21) it appears that we accredited Captain Reeves with views that somewhat misrepresent him. In that letter we said: ". . . The gist of the matter seems to be that a complete, and automatic, as far as possible, stamp mill, with a concentration plant attached, should be erected; the concentrates should undoubtedly be treated on the premises, but they are sufficiently rich, and the transportation facilities good, to be profitably shipped. Captain Reeves, the manager and part owner, has also come to about the same conclusion, and it is not improbable that something of the kind will be done before long. . . ."

In the above Captain Reeves does concur in the opinion that a concentration plant should be erected, and hopes to have it done, but he does not contemplate the removal of the present milling machinery, the Wiswell mills.

OHIO.

The following statement as to the coal production of Ohio is compiled from the report of Chief Inspector of Mines Haseltine, recently filed. The total output in 1889 was 10,907,385 tons, which, compared with the production of 1888, 10,911,946 tons, shows a falling off of only 3,561 tons. There were 20,323 miners employed, an increase over the previous year of 1,285. A gain in number of mines is also noted, there being 683 in 1889, as against 661 in 1888. The average number of days worked by each miner was 167.

PENNSYLVANIA.

COAL.

A dispatch from Dunbar says: "The coroner's inquest has become a contest as to who shall shoulder the responsibility for the disaster—the owners, the inspectors, or the mine boss. Inspector Keighley admitted that he had told a committee of miners he would close the mine if it was as bad as they thought; and that he found its condition worse than they thought. Neither he nor the other inspectors could have closed the mine without a lawsuit, as the mine boss had made a report that fatal morning, saying there was no gas in the mine. John Kerwin, who drove his pick into the borehole, told a dramatic story of the ensuing rush of water and gas and the final explosion. Experts testified that they would have used a small drill in boring into the hole, instead of allowing a man to pick into it. It developed that the company had made promises to remedy defects in the mine."

SILVER BROOK COAL MINING COMPANY.—This company has leased from the Reading Coal and Iron Company a tract known as the Summit Hill tract, comprising 540 acres of anthracite coal lands, situated in Kline and Rush townships, Schuylkill County. A small part of the Catawissa lands has also been leased to the Silver Brook Company. The company will open two collieries and ship coal over the Reading Railroad, paying royalty of 40 cents per ton. The minimum amount to be paid in any year is $20,000, and the lessees expect to ship from 400,000 to 500,000 tons per year. The Reading, Lehigh Valley, Pennsylvania and Lehigh and Susquehanna roads run over the Summit lands. This tract was sold to the Reading some years ago at $275 per acre, a total of $427,127. The Reading Company at that time paid in cash $64,127, and issued bonds for $363,000.

OIL.

The Chief of the Bureau of Statistics reports the total values of the exports of mineral oils from the United States for the month of June, 1890, as compared with similar exports during the corresponding periods of the preceding years as follows: June, 1890, $4,122,861; June, 1889, $4,262,263; twelve months ending June 30, 1890, $50,854,522; twelve months ending June 30, 1889, $49,420,817.

Exports of refined, crude, and naphtha from the following ports, from January 1st to July 4th, were as follows:

	1890. Gals.	1889. Gals.
From Boston	1,488,013	2,468,149
Philadelphia	66,661,410	63,614,507
Baltimore	4,210,096	1,888,349
Perth Amboy	6,797,955	9,690,737
New York	198,569,201	207,479,595
Total	276,726,675	285,141,33

SOUTH CAROLINA.

(From our Special Correspondent.)

LANCASTER COUNTY.

HAILE GOLD MINING COMPANY.—A brief communication from Capt. Thies, manager, reports that the hoisting plant has been destroyed by fire; it is unfortunate, as the mine is making such a fine record. The bullion yielded for June was a fraction over $9,175; the detailed cost of producing will be given as usual at an early date. Undoubtedly the vigorous management of this property will soon have everything again in running order.

VIRGINIA.

STAFFORD COUNTY.

RAPPAHANNOCK GOLD MINING COMPANY.—The president of this company, Mr. J. A. Macpherson, who has just returned from an inspection of the property, reports that the mine is being reopened. The plant has been put in repair and the reduction of ore will commence in 30 days. A new superintendent is in charge of the operations.

WEST VIRGINIA.

The large business interest coutrolled by the coal and railroad firm of H. G. Davis & Co., with headquarters at Piedmont, will be turned over to an incorporated company, of which ex-United States Senator H. G. Davis and his son-in-law, Lieut. M. G. Brown, are at the head. The Davises own a controlling interest in the West Virginia Central Railroad, besides many coal plants and lumber mills. The property controlled by the new company is said to be worth $20,000,000.

FAYETTE COUNTY.

THURMOND COAL COMPANY.—This company, of Thurmond, in the upper coal field on New River, in Fayette County, is erecting one of the first electric mining plants in the State. The plant completed will cost about $20,000. The mines will be supplied with electric lights and electric mining machines. The dynamos will have a capacity of 350 ampères.

M'DOWELL COUNTY.

LYNCHBURG AND WEST VIRGINIA COAL AND COKE COMPANY.—This company, organized by a number of Lynchburg and West Virginia capitalists, has leased a large tract of coal lands on the line of the Elkhorn extension of Norfolk & Western. The minimum capital stock of the company is $75,000, and maximum $300,000. with R. T. Adams, of Richmond, President, and N. Fitzhugh, of West Virginia, Vice-President.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

(From our Special Correspondent.)

NELSON, June 26.

EAST KOOTENAY DISTRICT.

CARBONATE MOUNTAIN.

A lead smelter is in course of construction at Golden City. I hope to give full particulars of the plant in my next letter.

CARBONATE MOUNTAIN DEVELOPMENT COMPANY, LIMITED.—This company has just been registered with a capital of £65,000 in £1 shares. The company proposes to acquire and develop sixteen claims in the Carbonate Mountain section of the Selkirk Range. This mountain is about 45 miles southeast of Golden City on the Canadian Pacific main line. Messrs. John Taylor & Co. had the claims examined on behalf of the company, and a very favorable report was presented. The ledges generally carry argentiferous lead ore, with small quantities of gold. One well defined ledge, however, carried 1 ounce 17 pennyweight 12 grains of gold per ton.

HOT SPRINGS DISTRICT.

Development work has been much hampered in this camp by the snow-water which has filled a number of the shafts. A Sutro tunnel on a small scale would facilitate the working of a large number of the claims.

BLUE BELL.—The usual force of men is being employed at this mine and with satisfactory results. The company entertains the idea of erecting a large lead smelter next summer. The machinery will be brought in on sleighs next winter, and be ready for erection as soon as next winter's snow has disappeared.

KOOTENAY SMELTING AND TRADING SYNDICATE.—The syndicate's smelter, at Revelstoke, designed for treating 60 tons of lead ore daily, is completed but is not running, owing to scarcity in the supply of custom ore. The mines in the Illecilliwaet district are not producing so much as was expected of them. Some of the smelter officers have lately visited Nelson, Hot Springs, and other neighboring camps to effect arrangements for the transmission of ore to their smelter. The syndicate, however, should *own* producing mines and thus keep their smelter running when the supply of custom ore falls short.

LITTLE DONALD.—This claim, owned by J. C. Davenport & Co., is one of the promising mines of the camp. Some 66 tons of ore, running from 100 to 160 ounces per ton in silver and high in lead, were shipped from this mine last year. A contract has been let to sink the shaft 50 feet deeper, then hoisting and pumping machinery will be placed on the property.

PACIFIC BULLION MINING COMPANY.—This company owns several claims in this district, the principal ones being the Spokane and the Trinket. L. C. Dillman, the heaviest stockholder, recently interested a St. Paul syndicate in the claims. G. W. Adrian was sent over to examine the property in the early part of the month, and if his report were satisfactory, one-fourth of the stock was to be purchased for $35,000. Mr. Adrian is reported to have said that the claims were even better than represented. The $35,000 (in the event of a transfer) will be expended in development work, and a $24,000 tunnel will be commenced at once.

SKYLINE.—Twelve tons of ore running upwards of $300 per ton were shipped from this mine last fall. Ore is now being sorted for another shipment. It is stated that the owners of this claim and of the Kras mine intend to erect a concentrator on Coffee creek, and to connect the mines therewith by a wire-rope tramway. Ore running $90 per ton was shipped from the Kras last season.

WEST KOOTENAY DISTRICT.

Comparatively little prospecting has been done this year owing to the lateness of the season and the continued rainy weather. The construction of the railroad between Sproat's Landing (whence there is a steamboat connection with the main line of the Canadian Pacific Railway) and Nelson is making fair progress and will prove a great boom to this district. As an offset, however, the last session of the Legislature saw fit to grant the railroad not only large tracts of land, but also a royalty of five per cent. over and above working expenses on gold and silver extracted from ores which may be found on any of the lands granted to the company.

At the same session liberal appropriations were secured for wagon roads and trails. Over $10,000 is to be expended in the Hot Springs and Nelson camps. At the former place it is proposed to construct a wagon road from the shores of the lake to the mines on the mountain at the back of the town. At the latter the road will probably extend from the town to the large group of copper-silver mines on Toad Mountain. These roads will considerably lessen the difficulty and expense of shipping the ore from these mines.

NELSON DISTRICT.

No capitalist has yet seen fit to erect a smelter at Nelson; nevertheless it would be a paying business, for there is a large margin for profit.

COTTONWOOD CREEK GOLD MINING COMPANY.—The company owns several gold claims on the Cottonwood creek, a few miles back from Nelson. Last autumn a 25-ton Huntington mill was erected, but the mill and mines are now lying idle, apparently not because of any difficulty with the ore or the mill, but because the moving spirit of the concern, a Mr. Stanley, is suffering from the effects of a sunstroke. At the same time I would say that free-milling processes are out of place here, for a great part of the oxidized upper portions of the veins has been removed by the general spread and movement of ice over this district during the glacial period.

EAGLE CREEK MINING COMPANY.—This company owns the Poorman mine, about six miles west of Nelson, and has an option on the White mine in the same locality. A 10-stamp mill was erected during the winter and the stamps began work on the 7th inst. The stamps weigh 850 pounds each, have a drop of 6½ inches, and crush a little over 20 tons of ore every 24 hours. The quartz carries free gold and a large percentage of sulphurets. The latter are treated on four vanners of the Triumph type. Power is supplied by water taken from the Eagle creek, operating upon a four-foot Pelton wheel. The clean-up has not yet been made, but everything appears to be working well. The concentrates will be shipped probably to the smelter at Revelstoke. Only a small force of men is at work at the mine, for the company wishes to realize on the ore—several hundred tons—now lying in the bins.

FORTY-NINE CREEK.—The chief attention of prospectors this season has been devoted to the gold belt between Eagle and Forty-nine creeks, a distance of 3½ miles, and several promising locations have been made, the ore in some cases running from $200 to $700 per ton. The claim known as the "Frenchmen's" is the best developed in this section. For 65 feet the vein was about 18 inches wide; another 45 feet showed an increase to 5 feet.

KOOTENAY BONANZA MINING COMPANY.—This company has had a force of men working on the Silver King claim through the winter. The winze from the lower tunnel is now down about 100 feet, making a total depth from surface of nearly 160 feet. Cross cuts have been driven at the bottom of the winze, showing upward of 40 ft. of ore and nothing in the shape of a wall. The large quantity of ore extracted during the winter is now on the dump, but it is said that no ore will be shipped this year. Work in the winze was stopped on account of the heavy influx of melted surface water, and the force of men is now employed in running a tunnel on the vein which will tap the winze about 165 feet from the surface. The tunnel will be 560 feet long, 7 feet high and 6 feet wide. About 70 feet have already been driven. The ore runs well in silver and copper, shipments occasionally running 570 ounces and 45 per cent. respectively.

The company also owns the Bonanza and the American Flag claims. Assessment work is being done on the Bonanza, but the American Flag is still covered with snow. The property was surveyed for patent last fall, but the Crown grant will not be issued until the merits of an adverse claim has been determined. The government wagon road will greatly benefit this property and the surrounding claims; at present everything has to be taken to and from the claims on pack teams.

QUEEN VICTORIA.—This property is situated on the north side of the Kootenay river nearly opposite Forty-nine creek. An option on a six months bond for $50,000 has been secured by Canadian Pacific Railroad officials. The ore deposit is said to resemble the Sudbury copper-nickel formation. The bonding party—in case it takes up the bond—binds itself to do $4,000 worth of development work during the six months, and is now awaiting the arrival of an Eastern expert specially familiar with the Sudbury deposit. The ore is known to be low grade, but it is present in large quantity, and the facilities for working and concentrating it on the spot are very good.

TOUGHNUT.—This promising claim is now the property of Hendryx Brothers (of the New Haven Mining and Smelting Company), a one-half interest having been transferred to them lately. Work was suspended on this claim during the winter. The shaft is down 37 feet, and the tunnel has been driven 127 feet. During the present summer a trail will be made from Nelson to the mine and the tunnel will be driven 400 feet or so further. The ore at times resembles the Silver King ore, running well in silver and copper; at other times lead and zinc predominate.

CANADA.

PROVINCE OF ONTARIO.

(From our Special Correspondent.)

PORT ARTHUR, July 7, 1890.

Negotiations are now pending for the sale of several promising prospects in the Atic Lake neighborhood. Ten thousand dollars cash was refused a few days ago for an undeveloped 80-acre location lying north of the lake. The Port Arthur, Duluth & Western Railway will run through this region and will reach there about November next. Mr. Lougheed, P. L. S., has just returned after surveying a large tract of iron lands on Black Sturgeon River, covering several hundred acres, for American capitalists. Samples of the iron brought in show it to be a red hematite averaging about 65 per cent. metallic iron, and free from impurities. English capitalists are negotiating for the purchase of several properties near the Lone Pine, Champion and Silver Victoria group.

BADGER SILVER MINING COMPANY.—Drifting both ways on No. 2 vein is being carried on; each drift is now in about 30 feet from the shaft. The vein is holding its width, the pay streak being two feet wide, and is described by a Colorado mining expert as the richest vein of silver-bearing ore he ever saw either here or anywhere in the western States during an experience of 20 years. The adit level is now in to bed rock, and is being pushed on by two shifts of miners to meet the drift. The mill is running constantly on ore from No. 3 (Porcupine). Altogether the Badger is in first class condition, and will make a splendid showing in the season's output.

BEAVER MINING AND MILLING COMPANY.—The mill is still at work on the refuse dump. The ore is keeping up its average of about 30 ounces to the ton. The company will finish it in a few days and will then begin on the regular dump, which averages 100 ounces to the ton. Captain Hooper's new slow motion vanner is giving entire satisfaction; its work is confined to the slimes that would otherwise be lost. Some very high grade shipping ore is being taken out of the stopes and barreled for shipment. The mill rock dump is having several tons of milling ore added to it daily.

LONE PINE.—Capt. Thomas H. Tretheway has just returned after making an examination and report on this property for R. R. Paulison. His report is highly flattering to the property, and recommends that development work be proceeded with at once. It is situated on the government road, three miles from the Beaver. About 100 feet of drifting into the bluff on the course of the vein was done last year, previous to the purchase by Mr. Paulison. It gave assays from 17 to 27 ounces of silver to the ton.

SHUNIAH WEACHU MINES COMPANY.—This company is now working two shifts drifting on the new vein, which was discovered by cross-cutting 30 feet north of the old vein. It ran four cross-cuts in from No. 4 shaft and one from No. 3; these shafts are 500 feet apart; the vein was found at No. 3 at the second level, at a depth of 200 feet, and in No. 4 shaft at the 100 and 160-foot levels. The pan streak is two feet wide, assaying 57 ounces of silver to the ton of 2,000 pounds, composed of blende and argentite. Some high-grade shipping ore and mill rock have been taken out. No. 3 shaft is now down 680 feet. The character of the country rock is changing. Considerable fluorite is coming in. The vein is four feet wide and improving. The company expects to strike the same ore chute that it did in No. 4 shaft, a few feet deeper, as it was dipping east and ought to come in shortly.

SILVER ISLET CONSOLIDATED MINING AND LAND COMPANY.—Orders have been given to place this company's docks, harbor improvements and houses at Silver Islet in condition for use. Very little work will have to be done on them, as Mr. Julian Gifford, who has been in charge since the mine shut down, has been very careful in the management of the company's property.

SILVER STAR MINE.—This property is situated west of Whitefish Lake, and immediately south of the Silver Fox and Mink Mountain locations. It is owned by W. A. Allen and others of Ottawa. Capt. Adams is in charge of the work. The company is drifting into the hill on the course of the vein, which has a uniform width of two feet, and is of the most encouraging character.

CENTRAL AMERICA.

HONDURAS.

SAN MARCOS MINING AND MILLING COMPANY.—From the report made to the government and published in the Honduras *Progress* we learn the following:

The "San Marcos Mining and Milling Company" owns a concession or zone of one league square, situated in the Department of Tegucigalpa near the town of Sabanagrande, 17 leagues from the port of San Lorenzo, on the Pacific coast. The elevation is about 2,250 feet above sea level. Within the zone there are three distinct veins, viz: "The San Marcus," "The Cross vein," and "The La O." On the first the principal work has been done.

In the year 1887 the company was organized under the laws of New Jersey, and capitalized at $250,000, 125,000 shares of $2 each. In February of the same year I began work on the property, first to open the San Marcos vein, and then to construct a stamp mill.

Up to date we have driven 2,100 feet of levels on the vein; have also sunk four air shafts and one working shaft; the working shaft is now down 214 feet and 154 feet below water level.

The San Marcos runs 30 degrees northeast by southwest and is vertical and a fissure. Average width 3½ feet; wall rock, porphyry. The ore is free milling silver containing about 10 ounces gold. The product of the mine to date has been about $100,000; average battery assays of all ore milled are $33.18 per ton of 2,000 pounds, of which we have saved 80 per cent. On the cross vein which runs north and south, crossing the San Marcos 900 feet east of our present opening, I have driven a tunnel 110 feet on the vein and find some very good pay, and no other work has been done by the present company on its veins, although a great deal of work has been done by the natives on the La O. vein at the Isabella mine. I have milled about 30 tons of ore which yielded $34.50 per ton silver and gold. The company employs about 130 men, natives and Americans. The mill consists of 10 stamps, 4 pans and 2 settlers, which are driven by a 75 H. P. Corlis engine, has also a complete assay and retort outfit. The hoisting plant consists of one 24 H. P. boiler, one Cornish pump and one steam pump and two hoists, all of which are in perfect order.

NEW YORK & HONDURAS ROSARIO MINING COMPANY.—From the same source as the foregoing we copy the report of this company. Since the last annual report to the stockholders, made December 1st, 1888, the waters of the San Juan River have been utilized with those of the Escobales, ensuring adequate power the year around to run the air-drill plant, which was started February 4th last. This power now suffices for all the other machinery as well, except during a few days at the end of an extraordinarily dry season.

There are at present at the mines five Rand and three Ingersoll-Sergeant drills, five of which are now steadily in operation. Their practical value is particularly evident in a cablegram from the mine, dated December 2d, reporting 88 feet work done on Uprise No. 1, of the 300-foot level in the preceding five weeks. Previous to this the work had been begun by hand in a winze from the 200-foot level, but when it had reached a depth of 12 feet the fast accumulation of water obliged its abandonment until the air-drills could be employed thereon, as before stated.

Sketches, maps, drawings and perspectives of all the company's property are on file, as are also drawings of the flume (2,790 feet long) water power, gravity road (about 700 feet), Hallidie tramway (14,000 feet endless steel wire cable), mill building, machinery, laboratory, office, residence and other buildings, roads, etc., etc.

Detailed reports of the work done at the mines conditions of levels and the progress made therein, are sent from San Juancito monthly. These are tabulated and kept with the other records of the company's affairs. As per these mine reports, the ore output from October 8th, 1888, to August 30th, 1889, was 24,329 tons, taken almost entirely from and above the 200-foot level.

The number of feet driven, sunk and raised, and the cubic yards of ore extracted during the present year, are shown by the tabulated reports.

The mill reports are fully detailed, embracing among other particulars the tons of ore delivered at the mill daily, the consumption of chemicals, and assays of the pulp, slimes, sand, concentrates and tailings. These reports are tabulated for inspection, and a résumé of these tables is appended to this report.

The tabulated statements of the mill work show that from November 1st, 1888, to August 29th, 1889, 20,674⅝ tons of ore were received at the mill. The assay value of the pulp was $40·48 per ton. The tailings averaged $6.61, and 78.26 per cent. of the assay value of the pulp was recovered.

The total bullion shipped from the mines between December 20th, 1888, and October 20th, 1889, amounted to $632,457.70, according to the bullion shipment reports in which silver is estimated at $1 per ounce. This sum includes bullion valued at $9,428.51 still in process of separation. The above bullion sold netted in New York $599,163.55.

The difference between the net amounts received for bullion bars and the sums stated in the San Juancinto shipments is owing to the differences in the price of silver, steamer freights, refining charges and other petty expenses.

The works in the upper levels having approached the end lines of the company's property, it was found necessary, on August 29th, to close the mill until a sufficient quantity of ore is developed in the lower levels to insure steady production of bullion.

The mill, machinery and appliances of all kinds not needed during the period of suspension of mill work have been carefully overhauled, repaired and packed, to protect them against deterioration. The same attention was given to all the supplies on hand. All these are now in such condition that there will be no delay in starting up the mill and its branches when the amount of pay-ore developed warrants such a step. Milling will then be resumed, putting into practice all such modifications of the processes hitherto employed as the changes in the ore-constituents will call for.

One hundred and fifty thousand dollars in dividends were paid to the stockholders from December, 1888, to June, 1889, when the board of trustees deemed it advisable to suspend further distribution until the lower levels are in condition to warrant resumption of bullion production. This work is now being vigorously pushed, and the indications are quite favorable, particularly in the 300 and 650 levels, which, judging from present appearances, justify the expectation of an early exposure of paying ore-bodies.

EAST INDIA.

MYSORE GOLD MINING COMPANY.—This English company operating gold mines in India produced gold during the year 1889 to the value of $960,000, as against $365,000 in 1888, the return for November having been as large as $101,000, and the last quarter of the year having amounted to $283,000, or a monthly average of $94,833. This product was the result of a 60-stamp mill, which has since been increased by fifty stamps. This property during the past four years just ended has produced gold to the value of $1,895,000.

MALAY PENINSULA.

SELANGOR.

MALAY STATES TIN MINES, LIMITED.—With a capital of £100,000, in £1 shares, this company has been formed primarily for the purpose of acquiring at Ayer-Itam, Batu and Pataling, in the State of Selangor, three concessions for tin mining granted by the Sultan of Selangor to Mons. Robert D'Orgeval, of 10, Rue Daubigny, Paris. It is stated in the prospectus that M. de la Croix, M.E., estimates the amount of tin available, on a moderate calculation, at not less than one million and a quarter sterling. The area of each concession is 150 acres, and the British Resident at Selangor has given an official assurance in writing of further grants to the concessionaire after the commencement of work. It is also stated that mining leases will be granted for a term of 21 years; there is no royalty, but an export duty equal to $12 on every 400 pounds of tin. The purchase price for the three concessions has been fixed by the vendor at £70,000, payable as to £33,300 in fully-paid shares, and as to the balance in shares or cash, or part shares and part cash at the option of the directors, leaving £30,000 as working capital.

NOVA SCOTIA.

(From our Special Correspondent.)

COAL.

CAPE BRETON.—Work continues brisk, the Reserve mines having shipped in one day last week 2,400 tons of coal. The company are now raising 100 tons a day out of their Emery slope. Prospecting is being briskly carried on in the hope of finding the extension of the various seams of the Sydney coal field in close proximity to Sydney Harbor.

SPRINGHILL MINES.—The strike at these mines continues, neither side appearing willing to give way. Many of the men have left to work on the ship railway and at the Cape Breton collieries. A seam of coal 4 feet 6 inches thick has been found at Salt Springs, about 6 miles east of Springhill.

VALE COLLIERY.—This colliery in Pictou County is reported to have made a contract with the Intercolonial Railway (government) for 40,000 tons of coal.

IRON.

NEW GLASGOW IRON AND RAILWAY COMPANY. This company has its main shaft at Bridgeville, Pictou County, 200 feet deep, and is at present raising about 100 tons of limonite a day.

GOLD.

Prospecting work has shown a lead near Malaga, in Queen's County two feet wide, which is claimed to run $100 to the ton in free gold, and a large lead has been found near Whiteburn in the same county, showing good promise. The last returns from the Thompson property, South Umacke, show promising results, which will be forwarded next week. Inquiries are made for arsenical ores, carrying gold. They are present in all the gold fields but deposits of any extent have not yet been discovered. The last returns from Central Rawdon show 517 ounces from 26 days' work.

MEETINGS.

Benton Consolidated Mining Company, at room 16, No. 320 Pine street, San Francisco, Cal., July 30th, at 1 P. M.

Geyser Mining & Milling Company, at Silver Cliff, Colo., July 24th, at 10 A. M.

Savage Mining Company, at Room 4, Nevada Block, No. 309 Montgomery street, San Francisco, Cal., July 17th, at 1 P. M.

Tuscarora Consolidated Mining Company, at Room 56 Nevada Block, No. 309 Montgomery street, San Francisco, Cal., July 17th, at 1 P. M.

DIVIDENDS.

Columbus and Eastern Coal Company. Interest on the first mortgage bonds of this company, due July 1st, 1890, payable at Bowery Bank, New York, on presentation. James Cochrane, treasurer.

Silver Mining Company, of Lake Valley, dividend No. 5 of 5 per cent. ($25,000) payable July 21st at No. 119 South Fourth street, San Francisco, Cal. Transfer books close July 14th and reopen July 21st.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Belcher, Nev.	40	June 27	July 31	Aug. 21	.50
Bodie, Cal.	12	June 16	July 22	Aug. 22	.25
Bodie Tun., Cal	16	May 21	June 25	July 16	.25
Big Hole Placer, Utah		May 28	July 2	July 21	.01
Con. New York	3	May 22	June 26	July 17	.15
Con. Pacific	12	June 21	July 28	Aug. 20	.10
Crocker, Ariz.	9	June 16	July 25	Aug. 15	.15
Dexter, Nev.	1	May 29	July 1	Aug. 1	.08
Found Treasure	6	May 22	June 26	July 18	.25
Golden Prize, Nev.	4	June 19	July 30	Aug. 18	.25
Hartshorn, S. Dak.	5	May 24	June 30	July 19	.00½
Holmes, Nev.	12	May 19	June 24	July 15	.25
Mayflower, Cal.	47	June 7	July 10	July 31	.30
Silver King, Ariz.	3	June 9	July 17	Aug. 11	20
Stanard Con., Cal	3	June 2	July 15	Aug. 9	.50
Teirakoff, Cal.	4	June 9	July 26	Aug. 23	.01

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Minneapolis, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 65 and 66.

NEW YORK, Friday Evening, July 11.

The business, or rather the want of it, of the week under review in no wise differs from those recently past. As a rule, indeed, we have at least one thing of interest to report, but this week we must chronicle a featureless market. The holidays of last week are of course in some measure to blame for the prevailing apathy. Dealers in mining stocks—that is, the majority of them—show a languid indifference to everything pertaining to mining. One man, in our hearing, suggested a new use for the Exchange. "It is a fine place," said he, "to go to sleep in."

Some attention has been given to the Colorado stocks this week, more especially to Leadville, which appeared the favorite. It is said that the large block of this stock which has been hanging over the market for some time, has been withdrawn. Still there is no apparent reason for the comparatively large dealings which have taken place, especially at the close of the week. It certainly is not based on any news from the mines for no one appears to have received any. During the week 16,500 shares were sold, the price advancing steadily from 12c. to 16c.

Chrysolite was neglected at 31c. Freeland advanced from 43c. to 50c., and sold 4,600 shares. Breece had a single sale at 33c. Little Chief was steady at 34c. to 36c. Small Hopes at 95c. was traded in. Silver Cord sold at 30c. La Crosse had one sale at 6c.

Horn Silver was quiet at $3.30 to $3.35. Ontario was not traded in.

We have no sales of the copper stocks to record this week.

Minnesota Iron Company shows two sales at $85@$86.

Alice was not dealt in. This stock is difficult to obtain at the prices which buyers are willing to pay. Most of the stock has been quietly gathered in during the past month or two.

Rappahannock shows transactions aggregating 2,600 shares at 5c. Reference to the company's property will be found in our mining news column.

El Cristo had a sale of 100 shares at 95c.

Of the Black Hills stocks, Caledonia sold 1,000 shares at $2. Deadwood Terra was dealt in at $1.40.

Of the California stocks Mono was dealt in at 60 @65c. Plymouth Consolidated shows two sales at $7. Quicksilver, preferred, was sold at $41.50@ $43, and Common at $7. Standard has one sale at 64c., assessment paid, and 9c. assessment unpaid. Astoria turns up with sales of 8,000 shares at 3c. Bechtel Consolidated visits the Exchange once more with sales at 22c.

Brunswick Consolidated seems on the downward plane. It started at 97 cents and declined steadily, closing at 75 cents. Sutter Creek also declined during the week with 2,900 shares sold at $1.15@ $1. Lodie Consolidated is higher and shows one transaction at $1.20.

Of the Tuscaroras Belle Isle disposed of 500 shares at $1.60 to $1.80, closing at the first figure. Navajo was higher, and showed an advancing tendency during the week, opening at 65c. and closing at 75c., with 2,000 shares sold.

Of the Comstocks Alta was dealt in at $1.35@ $1.40; Chollar at $3.90: Comstock Tunnel at 17c., and the scrip at 28c. Julia was steady at 50c. Justice turns up this week with one sale at $1.80; Kingston and Pembroke at 50c; Mexican at $3.15 @$3.25; Occidental at $1.50. Utah was steady at $1.20; Independence at 25c.@28c. Martin White appears this week, and was sold at $1@$1.10; Mt. Diablo at $2.25, and Ophir at $4.50@4.60 were traded in. Yellow Jacket shows one sale at $3.35.

Phœnix of Arizona was dealt in to the extent of 7,950 shares at $1.25 to $1.34. President Bradstreet writes that the concentrators will be in full operation early this month, and that the ten new stamps which were recently ordered have arrived and are being set up. This will materially increase the output. In a more recent letter he describes the new strikes made in the "Black Ledge" which show that the lead is 100 feet wider than previous development had shown. Work on the dam for the water power will commence at once. In the Stock Exchange to-day the stock of this company was bought at $1.34.

Silver King was represented by 1,100 shares at 42c.@44c.

Silver Mining of Lake Valley changed hands (1,000 shares) at 75c. This company has declared a dividend of 5 per cent. payable July 21. It is reported that there is a considerable sum in the treasury and that the company has nearly enough on hand to declare another dividend. This stock is pretty closely held and appears hard to obtain at moderate figures.

We note a solitary sale of Ruby Silver Mining Company's bonds at $104.50.

Mutual Smelting & Mining Co. showed a fair amount of activity during the week at $1.55@ $1.60.

Boston. July 10.

(From our Special Correspondent.)

Since my last letter the occurrence of practically three holidays has had a tendency to demoralize the market for copper stocks. This, added to a tight money market, has naturally tended to depress prices, and has given parties who have large bank accounts a chance to get good bargains.

As a whole, the market has been quite as well sustained as the general stock market, the confidence in the future of copper being quite marked and that they will fully recover under more favorable monetary conditions goes without saying. So long as the consumption of copper keeps pace with or exceeds the production, copper stocks will be in the ascendant. The movement in Kearsarge last week, by which the stock was carried up to $34½, culminated at that figure and it has since declined to $27. The decline in this stock is attributed not to any doubt as to the ultimate value of the property, but to the fact that there are too many people "long" of it, and as it is hard to borrow money on copper stocks, advantage was taken of this fact to raid the stock in order to reach stop orders, which was accomplished at $27. This stock and Allouez have been the most active of the list, the latter holding very firm at $9½ @ $10, although there has been some realizing. We expect to sell at $15, and that before many days.

Centennial has been one of the strongest stocks on the list; all efforts to depress the price did not succeed to any extent, a few shares only being sold at $37½, but it quickly recovered to $39, and sold to-day at $38½. The latest reports from the mine are that the vein in the ninth level, going south, shows continued improvement in width and richness. Captain Taylor says it shows 5 to 5½ feet of copper that will go 3½ per cent.

Tecumseh was dealt in at the board this week. This mine lies next to the Calumet & Hecla on the north and the Centennial on the west, and all the well-known copper lodes cross this property. The stock is 40,000 shares, par $25—an assessment of $2 has been called for, $1 of which is paid in, and the balance payable October 1st. Operations have commenced by sinking a shaft on the Osceola amygdaloid, and machinery will be put in to do the work. It is claimed that in time a large and productive mine will be opened up. The stock sold at $8 and $9—assessment of $1 paid—and is one of the best ventures on the market.

Boston & Montana sold this week, ex dividend, at $63 as the lowest point, closing to-day at $63½.

Calumet & Hecla has been very quiet, but steady at $308@$310, and Tamarack at $217@$210. Quincy sold at $125@$121 in small lots. Osceola declined to $44½ from no apparent reason beyond the pressure to sell for purpose of realizing.

Franklin has ruled quite steady at $23¼@$24.

The fancy stocks have had a quiet week. The speculation in them seems to have abated for the present, but a little later on they will come again to the front, and we would not be surprised if there should be an autumnal boom in them exceeding any of late years. There has been a quiet picking up of stocks to lay away for the future, and the market is pretty well cleared of the most desirable mines.

Silver stocks have been very dull, although there has been some demand for Breece and Catalpa, both of which are selling at about 40c.@ 42½c.

3 P. M.—The market closed with a firmer feeling for the coppers and slightly improved prices.

By Telegraph.—Kearsarge, $27, and Butte and Boston, $22½; Tamarack, $205, Calumet and Hecla, $306½; Quincy, $121; Boston and Montana, $63¼; Centennial, $38; Atlantic, $25; Franklin, $23½; Osceola, $45; Allouez, $9½ bid; Tecumseh, $7⅛; Arnold, $1⅝; Santa Fe 75c. bid.

Salt Lake City. July 5.

Company.	Bid	Asked.
Alice, Mont.	2.80	....
Anchor, Utah.	....	4.40
Alliance, Utah.	2.15	2.25
Apex, Utah.	.20½	.21
Barnes, Utah	.13½	.14
Big Camas, Id.	.72½	.77½
Crescent, Utah	.35½	.36
Cent.-Eureka, Ut.	....	20.50
Daly, Utah	22.00	22.50
Glencoe, Utah	1.30	1.50
Horn Silver, Utah	3.00	....
King of West, Id.	.50	.70
Mammoth, Utah.	4.35	4.40
Malad Con., Id.	13	....
Northern Spy	2.70	2.80
Ontario, Utah	....	....
P. C. M. Co., Utah	....	....
Rochester, Utah.	....	....
S. L. L. & P. Co., Utah.	....	....
Utah L. & C. Co, Utah.	....	....
Woodside, Utah.	....	....

St. Louis. July 9.

(From our Special Correspondent.)

With the thermometer ranging in the nineties for the past week, but little trading was indulged in at the Mining Exchange. Owing to the excessive heat, the Exchange decided to suspend the afternoon call until the beginning of September. The showing for this week's business is not up to the usual standard on account of the two holidays of Friday and Saturday. An attempt was made to trade on the Fourth, but it proved futile. The hot weather seemed to have a depressing effect on the mining stocks, the majority of them falling somewhat in value. Adams, Elizabeth, Mickey Breen and West Granite showed the greatest decline.

Starting at $1.32½ Mickey Breen had by Frid mounted to $1.37½, the highest point as reached by this stock, but when business was sumed on Monday the stock soon fell back to old position, and by Wednesday it had succeed

in dropping to $1.22½. Yet it sold quite actively, a total of 7,100 shares being sold during the week.

Central Silver suffered this week through a game of "bluff," carried on by two opposing brokers, and from 17½c. it soon fell to 7c. It is now quoted at 15c. bid. During the excitement 10,600 shares were disposed of.

Elizabeth has been on the decline this week, falling to $2.00, at which figure 700 shares changed hands, but the demand at this price raised it to $2.02½.

The regular shipment of the Bi-metallic was received yesterday. It amounted to 26,480 ounces of silver and 80 ounces of gold.

The Nellie, formerly known as the Cariboo, came up in the market for the first time this year with a bid of 30c.

Toutelotte is about to have another assessment of .02c.

Despite the encouraging reports coming in from the American & Nettie, the stock continued to fall during the week until $1.77½ was reached. It rallied, however, on Monday and Tuesday, and managed to recover its lost ground. L. A. Dunham, of this mine, was in town on Thursday, bringing with him $26,000, having left at Denver $14,000 more. He reports the mine to be in the best of condition, and from the outlook expects to make a big thing of it.

The stockholders of the Yuma will vote to issue new bonds to-day. They will be placed at once. The Board of Directors will in all probability close a contract with Mr. Heerdegen to visit the Yuma, and locate by means of his apparatus the running water of the mine. Mr. Heerdegen guarantees to find it if there, and as he comes well recommended, faith is put in the experiment.

Mountain Lion has been withdrawn from the regular Exchange trading stock list. It will be relisted in the fall under its new name, "The Lion."

During the week the Breece shipped 700 sacks of ore.

The Major Budd was sold last week to the Montana National Bank for a little more than $12,000, to satisfy the $13,000 claim held against it.

Supt. Erman, of the Nellie, writes that he has made all the necessary repairs on machinery, and will have all the water out of the mine by July 3. He can then begin stoping the ore on the first level below the tunnel, so that by the 15th the mill will be running.

Prices and sales from Tuesday, July 1, up to date:

Company.	Opening.	H.	L.	Closing.	Sales.
Adams, Colo	$1.02½	$1.02½	.90	.95	$30.0
American & Nettie.	1.80	1.87½	1.77½	1.82½	550
Bi-metallic	30.50	31.00	30.00	30.00	....
Buckskin	.09	.13	.08	.09½	4,200
Central Silver	.09	.17½	.07	.15	10,600
Cleveland, Colo	.03	.03	.03	.03	200
Cleveland, Idaho	.18¾	.18¾	.15	.18¾	1,842
Elizabeth	2 10	2.12½	2.00	2.00	1,350
Golden King	.03	.04½	.03	.03	100
Granite Mountain	44.00	....	....	45.00	...
Hope	1.85	....	....	....	....
I. X. L.	.02	.02½	.01	.02½	....
Ivanhoe	.08	....	....	.07½	....
Keystone	.01½	.02	.01½	.01½	400
La Union	.11	.12½	.11	.11	6,900
Little Albert	23¾	30	23¾	28¾	200
Mickey Breen	1.32½	1.37½	1.22½	1.22½	7,100
Major Budd	.07½	....	....	.06	....
Mountain Key	.30	...	....	....	.....
Montrose	.25½	....	....	....	.....
Nellie	.30	....	....	.40	.....
Pat Murphy	.12½	....	....	.11	300
Small Hopes	.93¾	.93¾	.90	.92½	200
Silver Age	1.55	....	....	1.57½	200
Tourtelotte	.01½	....	....	....	.....
West Granite	1.05½	1.07	.97½	.97½	100
Wire Patch	....	....	....	.15	.....
Yuma	.55	....	....	.52½	800
Total					35,342

Minneapolis. July 8.

Company.	Bid.	Asked.
Algoma	.55	$1.00
Auro a I. M. Co	8.00	....
Badger Silver Mg. Co	9.00	1.000
Bessemer Consol. I. Co	.15	....
Big Ox Mg. & Rec. Co	....	....
Black Hills Tin M. Co	.80	1.00
Canada G. Mg. Co	....	1.00
Carbonate Hill Mg. Co	.35	1.00
Clingstone I. Mg. Co	....	4.00
Crescent I, Mg. Co	1.00	....
Deer Lodge Mg. & Sm. Co	....	....
Derwood Con. Mg. & M. Co	....	....
Dot Iron Mg. Co	....	1.50
El Dorado I. Mg. Co	....	1.00
Fairview S. Mg. Co	.35	.50
Glengary S. Mg. Co., Mont	....	....
Gogebic Iron Co	2.00	3.50
Iron Duke Mg. Co	1.00	1.50
Kakabeka Mg. Co	.60	1.00
Keystone Mg. Co	.15	1.00
La Belle I. Mg. Co	1.00	1.50
Marquette Iron Synd.	....	3.50
North Pabst I. Mg. Co	....	....
N. W. Coal Mg. Co	3.25	3.75
Thunder Bay G. & S. M. Co	.75	1.00
White Spar Mica Mg. Co	1.75	2.00

* Actual sales.

Denver. July 7.

(From our Special Correspondent.)

The hot weather and preparations for celebrating the Fourth and laying of the corner stone of our State capitol made the three days of business on the floor rather quiet. Trade was fair, however, and as we are to have no other large excursions or conventions until August we look for an increase of business.

The parade of the members of the Exchange was unique and appropriate, being composed of 100 packed burros, with mining and camp utensils, attended by the horney-handed sons of toil, a bull, labelled "Col. Taylor," some bears chained and led by the owners, members mounted on the universal mule and officers in carriages. It attracted considerable attention, even in our headquarters of mining.

Your branch office had a very pleasant call from Mr. F. S. Bartlett, of Portland, Me., who is here in the interests of his Boston company, trying to make a selection of a site for its new method of treating zinc ores. What a wonderful change it will make in some of our camps when a successful process of this kind is firmly established, and we heartily wish him "good speed."

Col. Taylor, President of the Exchange, leaves for New York and Boston during the week in regard to placing some of the building bonds and listing some of our properties there.

Prices and sales during the week ending July 5th, 1890:

Company.	Opening.	H.	L.	Closing.	S.
Alleghany, Colo	21½b	23	22	22	500
Amity, Colo	06½b	07	06½	06½	4,200
Bangkok, C. B., Colo	10½	*11½	10¼	10¾	16,400
Bates-Hunter, Colo	42b	43	42	42	4,200
Brownlow, Colo	14½	*15	13¾	14¾	3,600
Calliope, Colo	38b	40	40	40	900
Cash	35b	36	35	36	1,200
Clay County, Colo	37½	*41	37½	37½	3,000
Hard Money, Colo	05½	06b	05	05	500
Little Rule, Colo	52	53	52	53	1,500
Matchless, Colo	125b	205b	100b	100b	.....
May-Mazeppa, Colo	76	*80	74	75	8,700
Mollie Gibson, Colo	80a	80a	60a	60a	.....
Oro, Colo	400b	750a	400b	400b	.....
Pay Rock, Colo	07¾	*08½	07	07½	18,900
Puzzler, Colo	18½b	20	19	17b	1,300
Reed-National, Colo.	72b	72b	72b	72b	.....
Running Lode	20b	*21½	20	20	2,200
Silver Cord, Colo	40a	40a	55b	40a	.....
Whale, Colo	33	33	33	31b	300
PROSPECTS.					
Argonaut, Colo	17b	*19	17	17½	3,500
Aspen United, Colo	10	10½	10	09b	1,100
Big Indian, Colo	11b	11½	10½	10½	300
Big Six, Colo	10b	11	10	10¾	7,700
Claudia J., Colo	07½b	*09	07¼	07½	5,500
Nat. G. & Oil, Colo	26¼	30	26	27½	1,500
Diamond B., Colo	08¾	09	08½	08½	16,700
Emmons, Colo	20b	*23b	20	19b	1,100
Golden Treasure, Colo	*19¾	*19½	16½	17¼b	800
Ironclad, Colo	26	*28	25½	27½	7,000
John Jay, Colo	13b	*20	14½	17	3,700
Justice	13b	14½b	13b	13b	.....
Legal Tender, Colo	05¼b	05½	05	05¼	2,300
Morning Glim, Colo	50b	50	49	50	200
Park Consolidated	20	*22½b	20	20b	26,500
Potosi, Colo	18½b	18½b	16	16	2,600
Rialto, Colo	62b	66	61	66	6,100
Total for the week					139,000

*Buyer 30 days †Buyer 60 days. ‡Seller 60 days.
§Seller 30 days. a Asked. b Bid.

Kansas City. July 5..

Company.	Opening.	H.	L.	Closing.	Sales.
Argonaut	15†	15	15	15	100
Bates-Hunter	39½	41½*	39	39½	9,900
B'g Six	8†	9	9	9	600
Brownlow	30†	....	....	....	.....
Cash Gold	28	28½	28	28½	5,100
Clay County	15†	35‡	....	....	.....
Diamond B	6	7*	6	7	2,000
Hard Money	5¼	5¼	4¾	5	12,700
Iron Clad	21	21	21	22½‡	500
King Jack	5†	75‡	....	....	.....
Little Nugget	78½	78½	76†	77‡	500
Little Rule	49†	51*	49†	51*	100
May Mazeppa	69½	70	69½	69½	9,400
Minnequa Zinc M. Co	25½	27*	25½	25½	8,200
Monte Cristo	3½	7*	3	6	3,100
Morning Glim	50	52*	49½	50	5,500
Pay Rock	7†	9‡	....	9‡	.....
Pelican	27½	30*	27½	28	4,000
Potosi	9	10	9	10	900
Sylph	..	..	..	..	.....
Total					65,600
Pit sales					.....

† Bid. ‡ Asked. * Buyer 30. § Seller 30.

Lake Superior Iron and Gold Stocks.

(Special Report by David M. Ford, Houghton, Mich.)

IRON MINING STOCKS.

Name of company.	Par value.	Bid.	Asked.
Ashland Iron Co	$25.00	$55.00	$58.00
Aurora Iron Co	25 00	8.00	8.50
Champion Iron Co	25 00	85.00	90.00
Chandler Iron Co	25.00	38.00	40.00
Chapin Iron Mining Co	25.00	30.00	33.00
Chicago & Minn. Ore Co	100.00	115.00	118 00
Cleveland Iron Co	25.00	18.00	18.50
Germania	25.00	11.50	12.00
Jackson Iron Co	25.00	110.00	....
Lake Superior Iron Co	25 00	70.00	75.00
Milwaukee Iron Co	25.00	5.50	6.50
Minnesota Iron Co	100.00	84.00	86.00
Montreal Iron Co	25.00	8.00	9.00
Norrie (Metropolitan)	25.00	65.00	68.00
Odanah Iron Co	25.00	20.00	22.00
Pittsburg Lake Angeline Co	25.00	175.00	180.00
Republic Iron Co	25.00	42.50	43.50

GOLD MINING STOCKS.

Name of Company.	Par value.	Lowest.	High.
Gold Lake Mg. Co	....	....	....
Grayling Gold & Silver Co	$25.00	....	....
Michigan Gold Co	25.00	$1.25	1.50
Peninsula Gold & Silver Co	25.00	.50	....
Ropes Gold & Silver Co	25.00	2.25	2.50

* Actual sales were made at these prices.

PIPE LINE CERTIFICATES.

(Specially Reported by Messrs. Watson & Gibson.)

What with the midsummer holidays and the general indisposition of the public to buy or sell crude petroleum certificates, the market has been one of exceedingly limited transactions and moderate in its fluctuations during the past week. The general tendency for the best part of this time was to higher prices, and oil sold above 90 for four days of the past week.

The well news has been unimportant. One report of the net stocks of the Tidewater Company placed the amount on June 30th at 528,000 barrels, showing an increase during June of 63,000 barrels.

NEW YORK STOCK EXCHANGE.

		Opening.	Highest.	Lowest.	Closing.	Sales.
July	7	89⅞	90	89	90	71,000
	8	90⅛	90⅜	89½	89½	60,000
	9	89¼	89¼	88½	88½	41,000
	10	88¼	88⅜	87⅝	87⅝	48,000
	11	87½	88⅛	87½	88¼	58,000

Total sales in barrels..... 278,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

		Opening.	Highest.	Lowest.	Closing.	Sales.
July	7	90½	90⅝	89⅝	90	25,000
	8	89⅝	90¼	89½	89⅝	68,000
	9	89¾	89⅞	88½	88½	43,000
	10	88⅞	88⅞	87¾	88¼	36,000
	11	88¼	89	88	88¾	58,000

Total sales in barrels..... 230,000

COAL TRADE REVIEW.

NEW YORK, Thursday Evening, July 10.

Statistics.

Mr. John H. Jones, chief of the Bureau of Anthracite Coal Statistics, furnishes us the following statement of shipments of anthracite coal (approximated) for the week ending July 5th, 1890, compared with the same period last year:

Regions.	July 5, 1890.	July 6, 1889.	Difference.	
Wyoming Region.Tons	295,463	357,095	Dec.	61,632
Lehigh Region ... "	106,981	105.442	Inc.	1,539
Schuylkill Region. "	187,282	165,443	Inc.	21,839
Total	589,726	627,580	Dec.	38,254
Total for year to date	15,776,148	15,775,182	Inc.	966

PRODUCTION OF BITUMINOUS COAL for week ending July 5th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1890. Week.	1890. Year.	1889. Year.
Phila. & Erie R.R.	1,883	67,120	33,117
Cumberland, Md.	69,363	1,847,540	1,499,792
Barclay, Pa.	3,010	73,700	57,003
Broad Top, Pa.	9,361	264,243	162,370
Clearfield, Py.	52,872	1,976,957	1,474,160
Allegheny, Pa.	19,854	681,182	408,731
Beach Creek, Pa.	37,375	948,323	612,125
Pocahontas Flat Top	37,088	962,543	770,746
Kanawha, W. Va.	55,672	1,058,303	782,335
Total	286,478	7,879,911	5,800,379

WESTERN SHIPMENTS.

Pittsburgh, Pa.	13,357	449,742	291,992
Westmoreland, Pa.	8,063	721,891	681,265
Monongahela, Pa.	11,611	205,293	150,387
Total	33,031	1,376,926	1,123,644
Grand Total	319,509	9,256,837	6,924,023

‡ Estimated.

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending July 5th, and year from January 1st, in tons of 2,000 lbs.: Week, 80,797 tons; year, 2,760,565 tons; to corresponding date in 1889, 2,255,317.

Anthracite.

The anthracite coal trade in this city is absolutely featureless. The summer season and the recent holiday are accountable for this in a great measure, but the tonnage being output also has an appreciable effect, just as has the difference in price between July and June. Here we are close on to the middle of the month, and July prices are scarcely reached, and there are not wanting suspicions, which take the form of insinuations, that much of the June coal is changing hands at prices sufficiently under the agreed scale to make the difference between May and June very trifling. No one admits the cutting, however, and the general surface tone of the market is that it is firm, and admittedly dull.

In some quarters there is a slight tendency to pessimistic views about the immediate course of the market, as there is an unmistakeable opinion abroad that the market should have been left alone for June and July, and the output kept at the May figures. But, as we have had occasion to point out before, allowing for a slight but steady increase in the consumption of anthracite coal, the output compares favorably with last year.

It is assumed that had May prices been left alone through June and July, and the June and July rises been put into effect as one in August, the summer trade would have been brisker, and there would have been much less in the coal yards than there is at present. It is only fair to say

hat this opinion is not that of people who are wise after the event, but rather of those who advocated that policy in the late spring.

Since the first of the month buying seems to have been duller than at any other period of the year; but the general expectation of a cold winter and the inevitable reaction from summer dullness, will soon improve business. In several exceptional ses coal is well sold up for the month.

The companies list prices f. o. b., for July remain: New York harbor for free-burning coals: Stove, $4; egg, $3.75; broken and chestnut, $3.65; pea, clear free-burning, $2.50 f. o. b.; other grades, 10 cents to 30 cents less; buckwheat, $1.60 to $1.80 f. o. b.

Bituminous.

Very little coal is coming forward, and it is perhaps just as well, as there is very little apparent demand for it. If the output has been small since the 3d inst., the means of transportation have also been somewhat restricted. Since the demurrage circular issued by the Pennsylvania Railroad Company went into effect it seems to have produced a result entirely opposite to that intended. Instead of being more plentiful cars have of late been harder to get, and, dull as the season is, this fact has had a very perceptible effect on transactions. Nevertheless, the output continues steadily, and the expected trouble at the mines has been averted, at least, for the present. This was accomplished in the case of the Frugality mines, Nos. 1, 2 and 3, of the Clearfield region, by the president of the Cresson and Clearfield Coal and Coke Company replying to the demands of the men by a lengthy statement. This is such an unusual occurrence in coal miners' strikes that it is worth recording. In the statement the relationship of the miners and operators and the identity of their interests are clearly set forth, and it is shown by unanswerable facts that if the company conceded the 10 per cent. advance at this time they might as well close the mines.

The moral effect of this settlement will be felt all over the soft coal regions. It is becoming evident that in all the soft coal regions the miners are either more indifferent about labor organizations or they are weakening. All the operators profess to feel confident that no labor troubles will interfere with the coming busy season. In freights the tale of the past few weeks is now told backwards. It is now vessels that are plenty and coal scarce at Philadelphia. Freights to Boston are easy at 90c. and to Portsmouth at $1. At Baltimore vessels are easier, with rates at $1.15 to Sound ports.

Prices remain: Baltimore, $2.40@$2.50 f. o. b.; Philadelphia, $2.50@$2.60; in New York harbor, $3.25; alongside, $3.50.

Boston. July 10.

[From our Special Correspondent.]

The market for anthracite coal is in a settled season of dullness, so far as wholesale trading is concerned, and there is manifest something of the weakness which is always present at such times. A good buyer could put on a block of stove coal at low figures to-day. The circular price amounts to nothing. One jobber whom I saw to-day had to scratch his head a minute to recall the precise circular figure last named on egg coal. He had done no business at circular, that was sure. The market is not really weak because jobbers are not forcing sales, but there is too much anthracite being produced at the present time, and the tendency of the market is not toward higher prices so far as it can be viewed from this port. Stove coal of excellent quality could be had to-day at $3.65 f. o. b. at New York, which is very near to lowest prices, and company stove coal can be bought at about $3.75. Broken is not so plenty, and is not so cheap relatively as stove, and ranges from $3.50 to $3.65; egg ranges from $3.60 to $3.75.

The bituminous coal trade is inactive. Receipts are larger. Jobbers have already done a heavy business both in anthracite and bituminous, and, as they say, in explanation of the present dullness, the trade can't be full of orders all the time. Soft coal continues firm at $2.25@$2.40 f.o.b.

Freights are easier, quoting as low as 60 cents on large vessels from New York, say at Hoboken and Port Liberty, and from that figure to 70 cents. At Baltimore the rate is off to $1.15, with $1.10 anticipated shortly, but the difference between Baltimore and Philadelphia still continues abnormal, because the Philadelphia rate has also dropped and is 95 cents to $1 with good prospects of 90 cents shortly.

The retail movement is improving somewhat. Dealers are delivering quite a large amount of coal. Owing to the absence of a strong combination low prices are ruling, say, $5.25 for stove. The retail trade is in good shape to make a profitable season if prices could only be maintained, as nearly all are well stocked and at low prices. There is no severe cutting as yet.

The receipts of coal at this port for the week have been as follows:

	For the week		For the year	
	1890.	1889.	1890.	1889.
Anthracite (tons)	54,128	43,110	769,038	648,616
Bituminous "	26,178	18,740	477,867	513,870
Total	80,306	61,850	1,246,905	1,162,486

Buffalo. July 10.

[From Our Special Correspondent.]

Hard and soft coal quiet and steady with no special features to report.

Canadian parties are in the city endeavoring to make some arrangements whereby they can organize a company to pipe the natural gas from Bertie County into Buffalo. It is now claimed that the supply from the 10 wells available is 25,000,000 cubic feet per day. The problem of piping the gas across Niagara River is easily solved.

The ocupancy of the north pier of our harbor by the trestles, pockets, etc., of the Delaware Lackawanna & Western Railroad, still furnishes food for thought and conversation. "As the company holds the pier by right of a revocable permission given by the War Department, it is not likely to be disturbed in its rights," says a railroad man, "and any attempt to oust it will be followed by legal complications." The whole matter is now before the House Committee on Rivers and Harbors at Washington.

No less than 748 tons of coal are lying at the bottom of Lake Ontario with 400 feet of water above it, in consequence of the burning and subsequently sinking of the steamer *Foley*, bound to Chicago last Wednesday week, 15 miles above Charlotte and 8 miles from shore.

The following communication was received here last Monday from Chicago: "A war in rates on coal which promises to dwarf the Eastern war in dressed beef rates, has begun. The battle was opened by a notice of the St. Paul that on and after July 10th it would apply to points in the West from Milwaukee the same rate on dock coal as is made from Duluth. This is a reduction of 25 cents a ton, making the rate to Sioux City, for instance, $2.41, instead of $2.66. The Lake Superior lines have always applied a 25-cent differential on this coal, and this alone would cause a rate war which will probably end in a rate of less than $1 to all points common to the Northwestern and St. Paul systems. But the hottest time is expected from the Spring Valley mine in Illinois, owned mainly by the Hon. W. L. Scott of Pennsylvania and President Hughitt of the Northwestern. Mr. Scott is also a director of the Northwestern, and some years ago Director Scott of the Northwestern made a contract with Director Scott of the Spring Valley mines to protect his coal from competition via Milwaukee. This contract has bobbed up and been ventilated at numerous meetings of the Western Freight Association, and for the sake of harmony the St. Paul has allowed the Northwestern to make the Lake Superior rate from Spring Valley. The St. Paul has found, however, that it must be on an even keel with its competitors, and instead of being forced out of the business, proposes to make in all cases the same rates via Milwaukee as via Duluth. This opens up a triangular fight in which all the Northwestern lines will be implicated, and which will reduce rates 25 cents a ton in see-saw fashion until the end is reached.

Mr. John Nesbitt's coal docks at Sarnia, Canada, with large elevators and other buildings, were burned yesterday.

Lake freights on coal opened July 1st with tonnage wanted but little offered; since then the same condition of affairs has existed, but no advance in rates is offered as an inducement. Vessel men firm in their views. The shipments of coal from this port, from July 1st to 9th, both days inclusive, aggregated 75,140 net tons, namely, 37,070 to Chicago, 9,640 to Milwaukee, 7,600 to Duluth, 650 to Toledo, 10,700 to Superior, 1,880 to Detroit, 2,300 to Saginaw, 100 to Ontanagon, 1,240 to Port Huron, 2,100 to Gladstone, 650 to Escanaba, 750 to Green Bay. Total thus far this season, 672,110 net tons. The rates of freight were 60c. to Chicago, 40c. to Duluth, Superior, Ashland, Saginaw, Marquette, 30c. to Detroit and Toledo, 50c. to Milwaukee and Green Bay, 45c. to Gladstone, 40c. to Ontanagon and Port Huron, 45c. to Escanaba, and 25c. to Bay City.

Coal receipts by canal first week in July, 1,530 net tons; shipments, 859 net tons.

Freights by Canal.—Buffalo to Syracuse, six loads coal, 65c. gross ton; 1 load ditto, 50c. net ton, and 1 load to Lockport at 35c. net ton, all free on and off.

Chicago. July 9.

From our special correspondent.]

The past week with its double holiday, has brought but little change in the Chicago coal market. It is said to be a matter of congratulation among those well posted that the outlook for the present year is far more encouraging than it was one year ago. The coal industry in our state has been beset with difficulties without number, all of which we believe to have been surmounted, and miners, dealers and all handlers have good cause to look forward to a season of prosperity. We believe the coal industry in this part of the boundless West to be in its infancy, with a trade of vast proportions looming up in the not very far distant future.

The Milwaukee & St. Paul Railway Co. will, after July 10, make the rate on coal from Milwaukee to western points, the same as from Duluth. This means a cut of 25 cents per ton.

The recent advance seems to have stimulated trade and has contracted the effect of the depression that has existed during the past two years.

The bituminous market is stronger than it has been for several years, and heavy buyers have to contract for two or three brands instead of one as heretofore; this would indicate that the full demand will find no surplus.

The coke trade is steady, looking to an increased demand in July and August.

Quotations are firmly maintained and many buyers of anthracite seeking to get in on former prices have been unsuccessful.

The conditions of the anthracite market show a healthy firmness after the late advance of 25c. per ton. Those well-posted predict a further advance of 50c. per ton prior to Sept. 1st. We continue to quote retail prices, large egg $5.75, small egg range and chestnut $6.

On cars f.o.b Chicago grate $5, stove, range and chestnut $5.25. Dealers express themselves as satisfied as to the situation and prospects for trade.

The midsummer market for bituminous coal is as good as could be expected; at the present time the prospect is that trade in this direction will be better later on. Manufacturers are in the market negotiating for future deliveries which acts, of course, as a stimulus to present trade; the figures of last week remain as yet unchanged, but very firm. They are, per ton of 2,000 pounds: Green and Sullivan County (Ind.) shaft, $2.25@$2.40; Jackson Hill, $3.25; Hocking Valley, $3; Ohio Central, $3; Erie, Briar Hill, $4.15@$4.20; Indiana Block, $2.35; Youghiogheny, $3.35; Sunday Creek, $3; Connellsville, $5.20.

Pittsburg. July 10.

[From our Special Correspondent.]

Coal.—The anomalous condition still continues in the mining situation—not enough miners to do the work required, and little disposition among those here to work longer, though they are receiving their own price.

Nominal rates in pools:

Per 100 bushels.		Per 100 bushels.	
1st pool	$4.75	3d pool	$3.90
2d pool	4.50	4th pool	3.25

Railroad coal, $5.00@$5.50.

Connellsville Coke.—The demand continues to increase. This is partly due to the fact that some furnaces that have been out of blast for repairs have resumed operations, and to an active demand for foundries and manufactories all over the country. Shipments were more or less hampered and restricted last week, owing to a scarcity of cars, due to the heavy general freight business of the railroads.

Prices remain firm at the following figures, per 2,000 pounds f. o. b. cars at ovens:

Blast furnace coke, $2.15; foundry coke, $2.45; crushed coke, $2 65.

Freights to Pittsburg, 70c. per ton; Mahoning and Shenango Valleys, $1.35; St. Louis, $3.30 Cleveland, $1.70; Chicago, $2.75.

FREIGHTS.

From Philadelphia to: Boston, 1.05@*1.10; Charleston, .70; Lynn, *115; New York, 90; Portland, 1.00; Pigeon Cove, Mass., 1.25; Providence, *1.00; Quincy Pt., 105; Richmond, .75; Washington, 85.

From Baltimore to: Bangor, 1.15; Bath, 1.15; Boston, Mass., 1.15; Brooklyn 1.05; Charleston, .75; Fall River, 1.10; Galveston, 3.40; New Bedford, 1.10; New Haven, 1.10; New London, 1.10; New York, N. Y., 1.05; Norfolk, Va., .55; Portland, 1.15; Portsmouth, N. H., 1.15; Providence, 1.10; Richmond, 70; Salem, Mass., 1.15; Savannah, .85; Somerset, 1.10; Williamsburg, N. Y., 1.05@1.10.

*And discharging. †Alongside. ‡And towage. §Flat

METAL MARKET.

NEW YORK, Friday Evening, July 11th.

Prices of silver per ounce troy.

July	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	July	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
5	4.87¼	47 13-16	1.01¼	9	4.88	48¼	*
7	4.87¼	47⅞	1.01½	10	4.88	48⅛	1.0 6
8	4.87⅛	48	1.01¾	11	4.88¼	48⅜	1.06¼

* 1.05¼ to 1.05½.

Silver market has been firm and steadily advancing in price after each step in legislation at Washington toward concurrence in the Compromise Bill. There now seems to be no doubt but that the bill will be signed by the President next week.

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its rate for discount, and remains at 4 per cent. During the week the bank lost £432,000 bullion, and the proportion of its reserve to its liabilities was re

duced from 34·90 to 34·81 per cent., against a decline from 41·54 to 39·05 per cent. in the same week last year, when its rate for discount was 2½ per cent. The bank lost on the 10th inst. £165,000 bullion on balance. The weekly statement of the Bank of France shows a loss of 6,225,000 francs gold and a loss of 3,825,000 francs silver. The weekly statement of the Imperial Bank of Germany shows a specie loss of 9,960,000 marks.

Silver Bullion Certificates.

NEW YORK STOCK EXCHANGE.

	Price. H.	Price. L.	Sales.
July 8	105¾	105	460,000
July 9	106	105½	245,000
July 10	106⅝	106	316,000
July 11	107½	106⅝	114,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

July 8	105⅝	....	20,000
July 9	105⅝	....	10.000
July 10	106⅜	106½	20,000
July 11	107½	106¾	70,000
Total sales			1,255,000

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked
Trade dollars	$ .81	$ 83
Mexican dollars	.83	.84
Peruvian soles and Chilian pesos	.75½	.76½
English silver	4.86	4.90
Five francs	.94	.95
Victoria sovereigns	4.90	4.95
Twenty francs	3.86	3.90
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.60
Ten guilders	3.96	4.00
Bar silver	107	108

Copper.—Great firmness still characterizes the entire copper market. For Lake copper bids of 16½ c. for very large quantities have been declined and nothing can now be bought at that figure. The producing companies are holding out firmly for 17c., but some ingots are still obtainable in the open market at about 16¾. An advance in the prices of casting copper is understood to be contemplated, but meantime quotations remain at 14¾@14⅞ for casting bands, and 15¼@15½ for Arizona copper. Early in the present week a sale of 1,000 tons Boston and Montana matte belonging to the French Bankers was reported at 11¼c. per pound ex store, New York, and it is understood that the sale is made on the condition that buyers accept the old weights and assays.

For various reasons the London market for Chili Bars and G. M. B. copper has been rather dull during the week, and prices have eased off slightly, the closing quotations received by cable to-day being £57 5s.@£57 7s.6d, spot, and £57 15s.@ £58, three months, a decline of about £1 on the closing prices last week. The latest quotations for refined and manufactured kinds are English tough, £63@£63 10s.; best selected, £65@£66; strong sheets, £71@£72; India sheets, £65@£66; yellow metal, 6½. The consumptive demand continues very large, and some important Indian orders have been in the market lately. It is anticipated that the statistics will again prove favorable for the first half of July, although a very large decrease can hardly be expected.

The exports of copper during the past week were as follows:

To Havre—	Copper.	Lbs.	
S. S. La Normandie	259 bars.	74,341	$8,070
To Bordeaux—	Copper.		
S. S. Chateau Lafite	734 bars.	226,303	24,750

Tin.—The market for tin has been rather irregular in connection with the progress of the silver bill. The consumptive demand has been good, and while at the beginning of the week some sales took place as low as 20·90 spot and 20·80 for later deliveries on higher quotations from London, and a better prospect of an early settlement of the silver question, the tone of the market has become much stronger, and we close firm at 21·20 spot, 21·20 July, 21·15 August.

The London market opened rather dull on Monday morning at £93 2s. 6d.@£93 5s. spot and £93 17s. 6d.@£94 futures, but has since improved considerably, and to-day's closing prices received by cable to-day are at the best figures touched, viz., £94 10s.@£94 12s. 6d. spot and £94 15s.@£95 three months.

Lead.—Some transactions are reported at $5.40, but there are no more sellers at this figure and it is anticipated that after the comparative inactivity of the past week or two consumers will soon have to come into the market again for large quantities. There appears to be very little metal now stored in warehouses, and there can be no doubt that the old stocks have been very greatly reduced, as for some time past deliveries have been going on from various warehouses, and nothing has been passing into store. We quote: spot and July 4.55 and August 4.57½ to 4.60. The latest London quotations are Spanish £13, English £13 5s.

The St. Louis Lead Market.—Messrs. John Wahl & Co. telegraph us as follows: "The situation of the market remains unchanged. Soft Missouri lead has been sold at from 2½ to 5 cents per hundred pounds less than refined. Sales aggregate for the week 500 tons. Desilverized and chemical lead sold at 4·35@4½c. The market is slightly firmer at the close."

Antimony has been a strong market with Cookson's quoted 24½ to 25 and Hallett's 20¾ to 21. Some shipments of the latter have arrived recently, but it is again scarce. LX is quoted at 22c.

Nickel is firmer again and we have now to quote 80@85c.

Spelter continues scarce and previous values are fully sustained. We quote 5·55@5·60c.

Quicksilver.—There is a fair, steady trade in this metal. Quotations are £10 10s. for London and $55@$56 for New York.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 11.

The iron and rail market remains firm, owing chiefly to the supply being at a low ebb. It is fortunate that the supply has been kept down, or a heavy market with lower prices might have been looked for. If there is any indication of an immediate change it is in the expected arrival in the market of several large consumers The holiday and hot season are, of course, responsible for the dullness. Business usually begins to move along toward the end of July, and the trade is looking forward confidently to a larger consumption for manufacturing and structural purposes. The demand for the latter is growing every week, owing to the fact that the present is the busy portion of the building season.

American Pig Iron.—Pig is moving slowly from the furnaces, which helps to keep the market firm. Of actual business there is little doing, except in regular supply. No. 1 Southern is generally short, but the light demand keeps the price where it was last week. In well-known brands business has been as lively as at any preceding July season, but there is little, if anything, doing in lower grades. Prices are the same nominally as last week, no particular transactions being of sufficient importance to shade them either way. Southern iron, No. 1, $17.50@$18, and No. 2, $16.50@$17. Northern brands sell for $18@$18.50 for No. 1 and $17@$17.50 for No. 2. Lowmoor, Va., pig iron, which varies little at any time, continues at $19@ $20, and the supply is only equal to the demand at that.

Scotch Pig Iron.—The news published in this department last week that a syndicate was in course of formation to obtain control of the Scotch pig iron on the other side created little surprise. The system of placing nearly all the iron in yards on warrants makes this easy to any one able to command 10 per cent. of the value.

Dealers in American pig iron have not the least feeling of opposition to any such syndicate cornering the Scotch supply, if it is its intention to increase the price. Such a move would have a sympathetic effect on the price of the domestic article. The supply in the Scotch yards is decreasing at the rate of something like 15,000 tons a week, and the furnaces are putting in a very nominal amount, as shown by the fact that the stock in yards on January 1 was 1,035,000 tons, which, according to the latest advices, has been reduced to 706,000 tons. The market is very firm, with prices at: No. 1 Coltness, $23.50; Dalmellington, $20.50; Eglinton, $19.75.

Spiegeleisen and Ferromanganese.—Sales are slow, and so are arrivals. There is little of either article moving and little demand. What business is done is at the prices which have ruled for some weeks. Twenty per cent. spiegeleisen may be quoted at $30 50@$31. A certain bear element is reported as selling ferromanganese as low as $72.50, with a latitude of $2.50. If those who published the report will go into the market and offer it at that price they will get such a rushing business that they will soon get tired. If actual transactions are a test of the market, $78 is the lowest price ferromanganese can be bought for. It costs more, delivered here, than the bear prices quoted as the ruling figure.

Steel Rails.—"Things are booming and prices stiffer," say the bulls. "No supply and no demand," say the bears. And the mean is about the truth. The market is dull. The output has in the main, been disposed of for some time ahead, but the season has appreciably affected dealings. As there is little demand, prices remain firm, though it is very doubtful if any one would cut the $32 figure more than 25 cents for anything less than a very large order, and even then there would have to be a saving clause in the contract about possible delay in delivering.

Rail Fastenings.—Very moderate business doing, and dealers find plenty of time on their hands to discuss the weather. Prices remain: Spikes, 2c.; angle plates, 1·85@1·90c.; bolts and square nuts, 2·70c., and hex. nuts, 2·95c.; complete joint, steel and iron, according to weight.

Structural Iron and Steel.—Trade is active and manufacturers have as many orders on hand as they profess to want. Such a steady increase in the use of iron and steel in large buildings has marked the past season that there is less eagerness in looking for orders, and consequently prices remain firm and unchanged: Universal plates, 2·20; bridge plates, 2·15@2·20; angles, 2·10@2·15; tees, 2·65; beams, 3·10.

Tubes and Pipes.—Business keeps up and everybody concerned is happy. The several large contracts to be divided among the various makers lead to some eagerness about disposing of present orders, and impart a briskness to the trade. Ruling discounts on car lots are: 47½ per cent. on butt, black; 40 on galvanized; 60 on lap, black, and 47½ on lap, galvanized; 40 on 1¾-inch boilers; 50 for 2 to 4-inch, and 52½ on larger than 4-inch casing, all sizes, 50 per cent.

Merchant Steel.—Stock taking is setting in, and many mills are closing for a week or two. Little business is doing, but what there is to record as being done is at the prices of the past few weeks, viz.: Best English tool steel, 15c. net; American tool steel, 7½@10c.; special grades, 13@ 20c.; crucible machinery steel, 5c.; crucible spring, 3⅝c.; open-hearth machinery, 2¾c.; open-hearth spring, 2¾c.; tire steel, 2¾c.; toe calks, 2¾c.; flat file, 4¾c.; mill file, 5½c.; taper file, 7½c.; first quality sheet, 10c.; second quality sheet, 8c.

Old Rails.—The demand continues good and the supply is entirely inadequate. There is now a triangular contest to get possession of this valuable, because scarce, commodity at ruling prices. This market, Chicago and Pittsburg are all short of old rails. The market has been supplied so continually and regularly that the railroads which hold rails, seeing the eagerness of buyers, now hold for a rise and demand anywhere from 75 cents to $1 a ton higher than we quote. Prices asked are $24.75@$25.25 for tees; $25.75@$26.25 for doubles. Muck bars are quoted at $29@$30.

Chicago. July 9.

(From our Special Correspondent.)

The present condition of the Chicago iron market is reported to be more satisfactory than it has been for the past three years. The iron industry is a feature of more than usual significance at the present time as regarded from this point. The production of both cords and finished irons is far in excess of any previous years, in so far as our market is concerned; the expanding consumption has prevented, of course, any undue supply on the market.

Mills that closed down in January for repairs are running full blast, and there will be no shutting down for repairs, as is the usual custom at this season of the year, except by mills absolutely compelled to do so. Prices remain steady; the output has been easily absorbed, and the outlook appears to be very encouraging. Some attribute the increased activity to the falling off in importations. Sales during the past short week, with its double holiday, have been active, and in every way the market may be said to be in a healthy condition. While many of the large contractors and consumers have been purchasing freely, a majority of them is as yet unsupplied; for this and other reasons the outlook may be considered as first-class.

Pig Iron.—Lake Superior charcoal furnaces are booking orders ahead, and there is but little disposition to shade prices. Indications are that this market will steadily increase in strength as the present month grows older. Cokes and charcoal irons have been very active. Of the former there is but little stock on hand at any of the Northern furnaces; all is shipped as fast as turned out. A few of the Southern furnaces have withdrawn from this market for the reason that they are full of orders; therefore, but little of this class of irons is now offered here. Lake Superior charcoal is held very firm.

We quote to-day for cash per ton of 2,240 lbs. f. o. b. Chicago for Nos. 1 and 2, Lake Superior charcoal No. 3, for car wheels, Nos. 4 and 5, for malleable, $20.50@$21; Lake Superior coke Bessemer, $18; Lake Superior coke Bay View, $17; No. 2, $16.50; No. 3, $16. Southern coke No. 1, $16.50@$17; No. 2, $15.50@$16; No. 3, $15@$15.50.

Southern charcoal, $19@$19.50; standard Southern car wheel, $24@$25; Ohio softeners, Hanging Rock, $18.50@$19; Jackson County, $18@$19; Hanging Rock cold blast, $26@$28; warm blast, $23@$25; No. 1 Scotch, according to brands, $25@ $26; American Scotch, $19@$20; Bay View Scotch No. 1, $17; No. 2, $16; Chicago Scotch No. 1, $17; No. 2, $16; Emma Scotch, $19@$19.50; Black band, Hubbard Scotch, $19.50; Haselton, $20.25; soft Silvery, $18; Wellston No. 1, $19; No. 2, $18.50@ $19; Hamilton No. 1, $18; Norton No. 1, $18@ $18.50; Zanesville No. 1, $18.

Bar Iron.—Under a first-class demand prices are firm on previous quotations. Dealers report $1.70 f. o. b. Valley mills as bed-rock, with no shading. A large amount of business is in view and mills report ample business to January next. Local mills are asking $1.85@$1.90 half extras and $1.80 for car iron. Store trade is good. Dealers ask $2@$2.20, according to quantity.

Black Sheet Iron.—Some manufacturers are practically out of this market. Mills now running

have a large amount of work—$3.10 for f. o. b. is the figure. At stores, $3.40@$3.50, and very firm.

Galvanized Sheet Iron.—The existing demand seems to be greater than dealers can supply. Consequently current quotations are maintained with great firmness, with a prospect of an early advance in prices. Discounts for both cheap and standard brands are now 62½ per cent. on Juniatta and 62½ and 5 per cent. on charcoal from store. Jobbing lots are quoted according to quantities.

Merchant Steel.—In addition to the inactivity in this market as reported last week, unusual hot weather and the holiday week since cause no change in quotations; dealers appear hopeful. The prices are: For tool steel, $7.75@$8; specials, $12@$25; open hearth machinery, $2.75; Bessemer machinery, $2.50@$2.60; open hearth spring, $2.60 @$2.65; tire, $2.50@$2.60; toe calk, $2.70@$2.80; crucible sheet, $7@$10; crucible spring, $3.75.

Car lots are: tire steel, $2.20; toe calk, $2.40@ $2.50; Bessemer bars, $2.25@$2.30; machinery, $2.60@$2.80 f. o. b. Chicago, 60 days.

Plates, Tubes, etc.—A very large volume of trade is in sight in this direction, soon to be placed, and mills will not shut down for repairs unless compelled to do so. To-day quotations remain unchanged, but an advance is expected next week. We quote as follows: Tank iron, $2.70; tank steel, $2.90; heavy sheets from 10 to 14, $2.90@$3; steel sheets 10 to 14, $3.25 @$3.50; shell iron, $3@$3.25; flange iron, $4@$4.25; flange steel, $3.50; shell steel, $3.25; boiler rivets, $4 @$4.25; fire box iron and steel, $4.75@$5.50; boiler tubes 4½ inches, and larger 52½ per cent., 2 to 4 inches 50 per cent., and 1¼ inches and smaller 45 per cent.

Structural Iron.—A large demand exists and is likely to continue for some time to come, yet it seems values remain stationary, notwithstanding that the heavy demand present and prospective would point otherwise; the output is large and competition active, which perhaps accounts for the situation. The present prices are: Angles, iron and steel, $2.30@$2.40; Universal plates, $2.50; sheared plates, $2.50; tees, $2.60@$2.70; beams and channels, $3.20.

Nails.—Mill agents say there is not much doing in new orders for steel cut nails since the last advance, and they quote $1.85@$1.90 f.o.b. factory. Dealers report a fair trade and unchanged prices, $2@2.05 for small lots of steel cut; for wire $2.50, and for wire nails at mill $2.35 is the figure.

Scrap Iron.—Referring to our report of last week as to steady prices, with a prospect of an advance in same, we quote: Country mixed scrap, $13.50@$14, according to condition; No. 1 mill, $14@$14.50; light wrought, $9.50, horse shoes, $19.50@$20; axles, $23; cast machinery, $12.50@$13; stove plates, $9.50@$10; borings, $8.50@$8.75; wrought turnings, $11.50@$12; No. 1 railroad shop or forge, $19.50@$20; track scrap, $19.50.

Sheet and bolt copper 25c. pound rates. Sheet brass, copper and brass wire, 20 per cent. discount factory delivery.

Louisville. July 8.

(Special report by HALL BROS. & CO.)

Inquiries and prices are about the same as in our last report. Inquiry for future delivery iron continues heavy, and there have been some special sales made at figures above the market. There does not seem to be any disposition on the part of many furnaces to sell at all, as a general strike at the furnaces has been looked for; but a scale of prices, we learn, has been agreed upon, and this question is practically settled. There have been some furnaces, however, shut down on account of labor troubles and for repairs, and it has, of course, reduced stocks, and as the furnaces have booked some months ahead they seem indifferent about selling at all just now. There is a very firm and confident feeling of a further advance in the near future, and makers are holding firm in their ideas as to prices. We quote substantially as last:

Hot Blast Foundry Irons.

Southern Coke	No. 1	15.50@	15.75
" "	No. 2	14.75@	15 25
" "	No. 3	14.25@	14.50
Mahoning Valley, Lake ore mixture		17.75@	18.75
Southern Charcoal	No. 1	17.00@	17.50
" "	No. 2	16.50@	17.00
Missouri "	No. 1	18.00@	18.50
" "	No. 2	17.00@	17.50

Forge Irons.

Neutral Coke	13.75@	14.25
Cold Short	13.75@	14.00
Mottled	12.75@	13.25

Car Wheel and Malleable Irons.

Southern (standard brands)	22.00@	23.00
" (other brands)	18.00@	19.00
Lake Superior	22.50@	23.00

Philadelphia. July 10.

(From our Special Correspondent.)

Pig Iron.—There are no indications, as yet, of the expected improvement in demand, but makers and brokers all think that a heavier demand is sure to set in very soon. The general conditions are favorable to makers. On the other hand, buyers are in no need of stocks, and are not likely to purchase heavily just now. No downward tendency is likely to occur. Small orders for foundry iron have been booked during the past few days. Quotations for No. 1 are $18@$18.50; No. 2, $16.50@$17. Nothing whatever has been done in mill irons, and quotations continue a $17.50 for average brands, although 25 to 50c. more and less has been named. There are a few makers in Eastern Pennsylvania who would shade prices if they felt it necessary; but as it is, they are content to await developments. There have been no sales of Bessemer, quotations, $19.50@$20.

Foreign Material.—Nothing has been done in spiegeleisen this week; quotations are given at $32. Ferromanganese is quoted at $75.

Steel Billets and Slabs.—Two or three inquiries have been received, but no sales reported. To-day's quotations for billets are $33.50; nail slabs, $32.50.

Muck Bars.—Two or three small lots of muck bars have sold at $29.50, delivered. There are offers at $29. It is likely that prices will weaken somewhat from these figures.

Merchant Iron.—A good many mills are idle this week, but repairs are being pushed forward rapidly, and it is thought that a pretty general resumption will take place on Monday. Some of the manufacturers have not signed the scale yet, however, and unless they do it is believed that the workmen will refuse to resume work. Refined iron is selling as low as 1·80 in country mills; medium, 1·70.

Sheet Iron.—Stocks in store are very light, and mills are booking orders, even at this dull season, for large lots. Quotations for best refined, 3@ 3·70. There is an excellent outlook for all kinds of sheet iron.

Skelp.—Skelp iron is quoted at 1·75 for grooved and 1·95 for sheared. Large orders are in sight.

Wrought Iron Pipe.—All of the mills are very busy, and the trade is in excellent condition.

Plate and Tank Iron.—There is nothing new to report in this department. Some few orders have been taken at as low as 2c. A good deal of business is in sight, and the fall trade will be very active.

Structural Iron.—No heavy orders for structural iron have been booked within the past few days, and quotations are given to-day at 2·20 for sheared plates, 2·15 for angles, 8·50 for tees, and 3·10 for beams and channels.

Steel Rails.—Very few sales have been made, and mill men are holding prices up to about $32 for small lots, although it is believed that $31 @ $31.50 would not be refused. A good many inquiries are in hand this week for light sections.

Old Rails.—Old rails are wanted much faster than it is possible to obtain them. Quotations, $25 @ $26, according to point of delivery.

Scrap.—No. 1 scrap is quoted at $22, and there is a demand for all that can be delivered.

Pittsburg. July 10.

(From our Special Correspondent.)

Raw Iron and Steel.—The past week has without doubt been the dullest we have experienced for some time, with a material falling off in transactions. This, however, is no more than natural when the situation is investigated. The extreme heat during a portion of the time was such that business was a secondary consideration; several of the mills were forced to close down in order to relieve the workmen. Again, this is the season for stock-taking, balancing books and making necessary repairs. In regard to values, prices for certain descriptions show a weaker feeling, and slight concessions may be accepted for round lots. Still, holders are not disposed to force business, being satisfied to wait, feeling certain that they will not have to wait long.

Prices of all descriptions of both iron and steel, as compared with the opening of the year, find the market rates on a much lower basis; for instance, Bessemer iron then sold $24.00@$24.50; Grey Forge, $18.25@$19; Mottled, $17.50@$17.75; No. 1 Foundry, $20.50@$20.75; No. 2 Foundry, $20; Muck Bars, $31.25; Steel Billets $30@$37.25; Nail Slabs, $37; Ferro-Manganese, $105; Spiegel, 10 and 12 per cent., $35; 20 per cent., $41; Steel Wire Rods, American, $51; Old Iron Rails, $28@$28.50; Spelter, $109; Bloom Ends, $26.

Compare these prices with figures that govern the market at the present time; it would seem that buyers have but little reason for dissatisfaction. The present situation, as viewed by a large proportion of the iron men, is showing more stability and a more healthy state of trade than the high prices that ruled six months ago. From the high figures of the beginning of the year, a heavy increase in production and the efforts of speculators to reap the advantage of advanced prices forced the whole market down almost to the low level of last summer. For some time past the market has been struggling to recover from this blow, and is now on a firmer basis with a general tendency toward higher prices, a larger demand and an increased consumption of all descriptions of iron.

Production has diminished somewhat, while there has been no decrease in the consumption; and as the market now stands a small increase in the consumption would be quickly felt in market values. A factor of great importance in the strength of the crude market is the absence of large speculative stocks. The long-continued endeavors to inaugurate in the American iron trade the system of storing pig iron upon advances and dealing in certificates has never met with marked success. The Eastern iron market is reported firm at full prices.

Coal and Coke Smelted Lake Ore.

1,500 Tons Bessemer	19.50 cash.
1,000 Tons Bessemer	19.60 cash.
1,000 Tons Bessemer	19.30 cash.
1,000 Tons Bessemer	19.00 cash.
1,000 Tons Grey Forge, August	15.50 cash.
500 Tons No. 1 Mill	15.75 cash.
500 Tons Bessemer	19.30 cash.
500 Tons Grey Forge	15.50 cash.
500 Tons Grey Forge, No. 4	15.25 cash.
200 Tons Mottled	15.75 cash.
100 Tons No. 2 Foundry	16.75 cash.
100 Tons No. 1 Foundry	17.75 cash.
50 Tons White Iron	15.40 cash.

Coke Native Ore.

100 Tons Silvery No. 2	17.00 cash.
100 Tons Silvery No. 1	18.00 cash.
50 Tons No. 2 Foundry	16.50 cash.
50 Tons No. 1 Foundry	17.50 cash.

Muck Bar.

1,000 Tons Neutral	29.00 cash.
1,000 Tons Neutral, August	29.50 cash.
500 Tons Neutral, August and September	29.50 cash.
500 Tons Neutral, August	29.65 cash.

Steel Slabs and Billets.

1,000 Tons Billets	31.00 cash.
1,000 Tons Billets	30.00 cash.
1,000 Tons Billets and Slabs	31.25 cash.
500 Tons Slabs	31.00 cash.
500 Tons Billets	31.00 cash.
500 Tons Billets	31.00 cash.

Skelp Iron.

1,500 Tons Sheared Iron	200 4 mo.
500 Tons Wide Grooved	185 4 mo.
300 Tons Narrow Grooved	175 4 mo.

Steel Wire Rods.

500 Tons American Fives, August	43.50 cash

Ferro-Manganese.

250 Tons 80 per cent., seaboard	73.50 cash.
100 Tons 80 per cent., Philadelphia	76.50 cash.
100 Tons 80 per cent., Balt., Sept	75.50 cash.
25 Tons 80 per cent., Pittsburg	78.00 cash.

Bloom Ends.

1,000 Tons Bloom Ends, Sept. to Oct	21.50 cash.
500 Tons Bloom Ends, Sept.	21.50 cash.
500 Tons Bloom Ends	21.50 cash.

Steel Blooms.

750 Tons Large Blooms	31.50 cash.

Old Iron Rails.

150 Tons American Ts, August	26.50 cash.

Prices.

Coke or Bituminous Pig—		20% Spiegel at New York	$31.75@32.00
Foundry No. 1	$17.50@17.75	Muck-Bar	29.00@29.50
Foundry No. 2	16.25@16.50	Steel Blooms	31.00@31.50
Gray F. No. 3	15.50@16.00	Steel Slabs	31.00@31.50
" No. 4	15.00@15.25	Steel Cr'p Ends	21.00@21.50
White	14.50@15.00	Steel Bl. Ends	21.50@21.50
Mottled	14.50@15.00	Ferro-Man., 80% f.o.b. Baltimore, Sept.	75.50
Silvery	17.50@18.25	Steel Billets	31.00@31.50
Bessemer	19.00@19.50	Old Iron Rails	27.00@
Low Phos	24.00@24.50	Old Steel Rails	21.50@22.00
Charcoal Pig—		No. 1 W. Scrap	20.00@21.00
Foundry No. 1	23.50@24.50	No. 2 W. Scrap	18.00@
Foundry No. 2	22.00@22.75	Steel Rails	32.00@
Cold-Blast	25.00@29.00	" light sec.	32.00@36.00
Warm-Blast	24.00@25.00	Bar Iron, nom.	1.85@ 1.90
10 + 12% Spiegel f. o. b. N. Y.	29.00	Iron Nails	1.90
		Steel Nails	1.90
		Wire Nails	2.25@ 2.30

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, July 11.

Heavy Chemicals.—There is but little change to report in the condition of this market. Prices are not much higher, although a firmer feeling prevails. Carbonated soda ash for immediate delivery is quite dull, but for forward delivery there has been more inquiry. Quotations are 1·40@1·50c., according to quantity, with but little of the 58 per cent. variety on hand. Scarcely anything is doing in caustic soda ash, which is quoted nominally at 1·40@1·45c. for 48 per cent.

Caustic soda continues, as for some weeks past, to attract the most attention. It is reported that a good amount of business has been transacted. For 60 per cent., to arrive, the quotations are $2.87½@$2.90; 70 to 74 per cent., $2.67½@$2.72½.

Sal soda is firm, and shows an advancing tendency. There have been some sales at $1@$1.05.

Bleaching powder is dull and in an unsettled condition. Quotations here are given at $1.25@ $1.40, according to brand.

Acids.—During the past week business in acids showed no improvement as to volume of business. The condition of this market, so far as prices are concerned, continues as bad as ever, and apparently there is but little prospect of any betterment in the near future. Sulphuric acid continues to be sold at very low figures, and it has not resulted in greater business. Just when the present demoralized state of affairs will come to an end no one knows.

Acid, per 100 pounds in New York and vicinity: Acetic, $1.75@$2.25; muriatic, 18-degree, 80c.@ $1.25; muriatic, 20-degree, 90c.@$1.50; muriatic, 22-degree, 90c.@$1.75; nitric, 36-degree, $2.75@ $3.50; nitric, 40-degree, $3.25@$4.50; nitric, 42-degree, $3.75@$4.75; sulphuric, 60-degree, 70@80c., and sulphuric, 66-degree, 85c.@$1.

Fertilizing Chemicals.—With the exception of sulphate of ammonia, fertilizing chemicals are quiet. The demand for gas liquor has done away with a competitor to the bone sulphate, and consequently the latter is higher. Some sales of dried blood are reported.

Quotations are: High grade dried blood $1.90@ 1.95. For the low grade the price is $1.80@$1.85.

Azotine, $1.90@$1.95. Tankage, high grade, 9 to 10 per cent. ammonia and 15 to 20 per cent. phosphate, $19@$20 per ton, and low grade 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, $18@$18.50. Fish scrap, $20.50@$21 per ton. f.o.b. factory. Sulphate of ammonia at $3.10@$3.15 per cwt. Concentrated tankage, $1.80@$1.85. Refuse, bone black, guaranteed 70 per cent. phosphate, $18.50@$19 per ton. Dissolved bone-black is nominally 95c. per unit for available phosphoric acid, although on large lots prices might be somewhat reduced, and acid phosphate 80c. per unit for available phosphoric acid. Steamed bones, unground, $20@$23; ground, $25@$26.

Charleston rock, undried, $5.75 per ton; kiln-dried, $7@$7.25 per ton, f. o. b. vessels and cars respectively at the mines. Freights by sail from Charleston to New York, $2.75@$3.50 per ton. Charleston rock, ground $11.50@$12, ex vessel at New York.

Quotations are for 48 to 52 per cent. sulphate of potash, $1.12½ per 100 pounds for shipments from date; high grade manure salts, basis 90 per cent. sulphate of potash, $2.37½ per 100 pounds.

Kainit.—Quotations are $9.75, and some business is reported, especially to Southern ports.

Muriate of Potash.—About 300 tons arrived during the week, all of which was contracted for. Very little business is ever transacted at this time of the year, it being between seasons.

Brimstone.—Prices have declined slightly. For August-September shipment $20.50 and $20 for best unmixed seconds and thirds respectively are quoted. For nearby supplies quotations are $21.50 and $20.50.

Nitrate of Soda.—Mr. F. B. Nichols sends us the following interesting statistics, issued under date of the 1st inst.

	1890.	1889.	1888.
In store and afloat at Atlantic ports, Jan. 1, bags	51,726	86,000	62,940
Arrivals at Atlantic ports to July 1	382,730	258,509	314,848
Exports			19,870
Deliveries for consumption at Atlantic ports to July 1	974,719	267,649	224,688
In store and afloat do	59.737	76,860	133,230
Average price	1.76	2 21	2.06¼
In store and afloat at Atlantic Ports, July 1, 1890			76,860
Arrivals at Atlantic ports to January, 1890			245,575
			322,435
In store and afloat Jan. 1, 1890			51,726
Deliveries last six months of 1889			270,709
Deliveries last six months of 1888			230,944

	1890.	1889.	1888.
In store and afloat in Europe, Jan. 1	1,477,500	585,000	490,000
Imports to July 1	3,742,500	3,450,000	2,925,000
Deliveries	4,305,000	3,217,500	3,115,000
Stock, July 1	915,000	817,500	300,000
Exports from S. America to all ports, July 1.	2,692,500	2,752,500	1,807,500

"The course of the market under review was the same as last year. Then, we started at 2⅝ spot and ended in June at 1·85. This year we started at 1·90 and recent sales were made at 1·65. The same cause operated in both periods. More stuff offered than was wanted, notwithstanding the fact that the increase of consumption is 40 per cent. more than the first six months of 1889. The market has been in the hands of buyers throughout, and will probably continue so until the present uncertainty as to the ultimate action of the producers is settled. We have looked for another syndicate because a movement in that direction had been started with a promise of success, although we had not forgotten the bickerings and jealousies of the last which broke up in disaster to many of its members. It looks now as if the threats that were freely uttered in that altercation might materialize, and the survival of the fittest would follow. The European deliveries were very large and justified the prediction that low prices would greatly increase its use in agriculture. How long shall we have to wait for an appropriation for a propaganda in this country, same as was given to Europe three years ago with splendid results? The increased consumption this year in this country is due partly to a growing demand from farmers. This has been especially noticeable in one or two more advanced Southern States for the cotton crop. The total deliveries in this country, including California, 414,719 bags against 302,000 in 1889; 26,888 in 1888; 261,476 in 1887. In Europe the deliveries were 4,305,000 bags, against 3,217,500 in 1889; 3,115,000 in 1888; 2,355,000 in 1887; making total for the world, the first half of 1890, 4,719,719 bags, against 3,519,500 in 1889; 3,376,888 in 1888; 2,616,476 in 1887. The quantity to arrive at Atlantic ports is 349,800 bags not including charters for later sailing, but comprising all that can come in this year, against 256,200 for the same situation last year, 207,500 in 1888, and 275,000 in 1887, making total visible supply 409,537 bags, against 333,060 last year and 340,730 in 1887. The quantity to arrive in Europe is 1,087,500 bags, against 1,327,500 in 1889, 1,132,500 in 1888, 930,000 in 1887, making the total visible supply there 2,002,500 bags, against 2,145,000 in 1889, 1,432,500 in 1888, and 1,065,000 in 1887. The total visible supply for the world is 2,412,037, against 2,478,000 in 1889, 1,789,230 in 1888, and 1,408,435 in 1887."

Liverpool. July 2.

(Special Report by Messrs. J. P. Brunner & Co.)

Although there is not much trade passing on the spot prices generally are pretty steady, and in the case of caustic soda are rather firmer. There are a fair number of inquiries for forward delivery, but manufacturers are declining to quote in most cases beyond this month, in expectation that the "Chemical Union" will shortly be formed. Although one or two of the Lancashire makers have so far declined to join the movement, it is thought that the Syndicate will be formed without their aid. Some makers talk as if it was only a question of a very short time, for the combination to be successfully floated.

Soda ash is quiet, but quotations are nominally unchanged as follows: Caustic ash, 1½d.@1¼d.; car. ash, 1¼d.@1⅝d., according to brands.

Soda crystals are in demand, and difficult to find any sellers at under £3 5s. per ton.

Caustic soda very scarce, and, although the orders are not large, buyers have to pay full prices for anything they want. A fair number of sales have been made of 70 per cent. at £8 15s. for prompt delivery, and £8 12s. 6d.@£8 15s. for July, while in some cases as high as £9 is asked by makers, which figure has been paid at the close for early delivery.

Sixty per cent., £7 12s. 6d.@£7 15s., and not easy to buy at the lower figure. The lower figure bid and refused at the close.

Seventy-four per cent. is almost unobtainable for July, and £9 7s. 6d.@£9 10s. are nominal quotations.

Seventy-six per cent., £10 5s.

Bleaching Powder is quite neglected, and £4 17s. to £5 are nominal spot quotations.

Chlorate of Potash quiet at 4½d. to 4¾d. per pound, according to make, and there is little offering.

Bicarb. Soda in request at £5 15s. per ton and upwards for one cwt. kegs, according to brand and quantity, with usual allowances for larger packages.

Sulphate of ammonia continues to meet with a good inquiry from the States, and dearer at £11 10s.@£11 12s. 6d. for good gray 24 per cent. in single bags f.o.b. Liverpool.

BUILDING MATERIAL MARKET.

Bricks.—There are a good many supplies coming forward. The demand is good, but not sufficient to prevent the accumulation which is now going on. Prices are rather better at the close than at the beginning of the week under review. We quote: Haverstraw, $5.50@$6.50 per thousand; Uprivers, $5.25@$5.75; Jerseys, $4.50@$5.25; pales, $3@$3.50 per thousand.

Lime.—There is a fair demand for common and a very good demand for finishing lime, Rockland common and finishing are firm at 90 cents and $1.20, respectively. Very little lime is being shipped from Maine just now. When prices showed an inclination to decline manufacturers stopped shipments. Vessels are hard to obtain on account of the higher freights paid for stone and ice. Other quotations are: St. John, common and finishing, 90c.@95c.; Glens Falls, common and finishing 85c.@$1.10.

Cement.—Prices are well maintained. There is a large demand for Portland cement, which may be partly due to the expected tariff on cement. We quote this week: German Portland cement, $2.40@$2.70; English, $2.30@$2.45; Belgian, $2.20@$2.30, and American, $2@$2.20.

NOTES OF THE WEEK.

The Master Builders' Association of Boston met on Monday night. Letters were received from the bricklayers and the building laborers asking for a conference. It was voted not to have an immediate conference, but to have one some time in the future. There was also a discussion of the present discrimination by union men against non-union men, and it was finally voted to post the following notices on every job of every member of the association: Forty-two cents per hour for competent masons; 25 cents for competent hod carriers and mortar mixers; 22 cents an hour for ordinary laborers; no discrimination against union or non-union men, and the keeping from the building of "walking delegates," who influence the men to strike.

IMPORTS AND EXPORTS OF METALS AT NEW YORK JUNE 28 TO JULY 5 AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co.	25	222
Hendricks Bros.		50
La Marche's Sons, H.		5
Lewisohn Bros.		50
Meyer, G. A. & E.		9
Muller, Schall & Co.		93
Total	25	429
Corres. date, 1889.	70	388

Pig Lead.	Lbs.	Lbs.
Caswell, E. A.		111
Hendricks Bros.		50
Schultz & Co., A.		98
G. W. Sheldon		149
Total		408
Corres. date, 1889.		129

Tin.	Tons.	Tons.
Abbot, Jere, & Co.		50
Amer. Metal Co.		2,125
Bidwell & French.	50	690
Bruce & Cook		10
Carter, Hawley & Co	20	50
Cohen, H.		20
Cort & Co., N. L.	50	50
Crooks & Co., R.		75
Davol & Son		15
Hendricks Bros.		26
Lehmaier, S., & Co.		67
Lewisohn Bros.	10	10
Merchant & Co	10	10
Muller, Schall & Co.	100	620
Naylor & Co.	280	1,121
Nissen, Geo		10
Phelps, Dodge & Co.		2,350
Thomson, A. A. & Co.		30
Thomson, D. & Co.		50
Townsend, & Co. J. R.		30
Trotter & Co, N.		75
Total	520	7,484
Corres. date, 1889.	485	5,417

Tin Plates.	Boxes.	Boxes.
Bruce & Cook	5,222	66,267
Byrne & Son		1,000
Central Stamp. Co.	735	44,446
Coddington & Co.	7,808	64,989
Cohn & Co	680	12,075
Con. Fruit Jar Co.		120
Corbiere F. & Co.		6,072
Cort & Co.	3,064	84,734
Crooks & Co.	6,646	33,067
De Milt & Co, H. R.	332	1,200
Dickerson, V. D. & Co	18,999	187,416
Fenton, D. E.	260	260
Haberman, F.		66
Herring, Chas. E.		1,000
Iron Clad Mfg. Co.		379
Lalance & G. M. Co.		8,116
Lazard Bros.		1,048
Lehmaier, Schw'z & Co.		200
Merchant & Co.	481	12,509
Mersick & Co.	238	6,060
Morewood & Co.		35,220
Newell Bros.		416
Payne, S. H. & Co.	100	684
Pratt Mfg. Co.	7,631	62,504
Phelps, Dodge & Co	66,839	418,325
Shepard & Co.	681	2,407
Taylor, N. & G.		1,229
Thomson & Co., A. A.	2,152	65,286
Warren, J. M		3,530
Wheeler & Co.		14,285
Whittemore & Co.		12,053
Wolff & Reesing		2,077
Wright, Peter & Co.		227
Total	121,871	1,149,367
Corres. date, 1889.	60,367	1,287,715

Pig Iron.	Tons.	Tons.
Abbott & Co., Jere.		100
Baldwin & Co., A.		307
Baldwin Bros. & Co.	170	170
Crocker Bros.	100	900
Crooks & Co., R.		5
Dana & Co.		150
Geisenheimer & Co		76
Hagermeyer & Brun		30
Irvin. R. I. & Co.	50	250
Lillienberg, N.		1,909
Naylor & Co.		150
Pierson & Co.		30
Sheldon, G. W. & Co.		200
Stetsson & Co., G. W.		1,625
Williamson, J. & Co.	100	1,200
Total	420	7,102
Corres. date, 1889.	1,307	14,131

Steel Blooms, Billets, and Slabs.	Tons.	Tons.
Baldwin Bros. & Co.		2
Dana & Co.		1,356
Downing, R. F. & Co.		5
Henderson Bros.		1
Martin & Co		80
Milne, A., & Co.	50	68
Pope, Jas. E., Jr.		61
Roebling's Sons, J. A.	101	1,699
Wolff, & Co., R. H.		60
Total	151	3,332
Corres. date, 1889.	202	47,909

Bar Iron.	Tons.	Tons.
Abbott & Co., Jere.		490
Bacon & Co.		843
Crocker Bros.		77
Dickerson, Van Dusen & Co.		6
Downing & Co.		285
E. J. Jacobus.	2	7
Fuller, Dana & Fitz.		11
Holt, H. N.		60
Lillienberg, N.		447
Lundberg, G.	250	1,587
Milne & Co.	560	794
Muller, Schall & Co.	20	289
Naylor & Co.		25
Page, Newell & Co.	52	1,462
Plenty, J	4	14
Wilson, J. G.		3
Total	888	6,400
Corres. date, 1889.	342	3,685

Scrap Iron.	Tons.	Tons.
Crossman & Co., W. H.		30
Muller, Schall & Co.		18
Samper & Co., S.		186
Stevens, Corvin & Co.		30
Ward, J. E. & Co.		392
Total		656
Corres. date, 1889.	25	1,058

Steel and Iron Rods.	Tons.	Tons.
Abbott & Co.	247	5,819
American S. Co.		565
Bacon & Co.		73
Carey & Moen.		256
Cooper, Hewitt & Co.		371
Dana & Co.	75	448
Downing & Co.	6	81
Galpin, S. A.		1,066
Greely & Co. C. S.		35
Hazard Mfg. Co.	23	240
Jacobus, E. Y.		2
Lee, James & Co.		1,249
Lillienberg, N.		300
Lundberg, G.		126
Milne & Co.		456
Muller, Schall & Co.		607
Naylor & Co.		3,704
Page, Newell & Co.	51	1,129
Roebling's Sons, J. A.		1,897
Schulze, P. R		1
Temple & Lockwood		6
Wiebusch & Ho.		4
Wood & Niebuhr.		25
Wolf & Co., R. H.	26	2,733
Total	428	21,193
Corres. date, 1889.	815	27,484

Old Rails.	Tons.	Tons.
Bowring & Archibald		340
Frankfort. M.		3,282
Henderson Bros.		300
Hernsheim, L		350
Mosle Bros.		123
Naylor & Co.	491	1,968
Sawyer, Wallace & Co.		610
Total	491	6,973
Corres. date, 1889.		9,135

Spiegeleisen.	Tons.	Tons.
Abbott, Jere & Co.		2,735
Blakely & McLellan		1,684
Crocker Bros.	681	13,243
Crooks & Co., R.		106
Dana & Co.	600	14,317
Foley, F.		50
Geisenheimer & Co.		308
Hernsheim, L.	686	13,588
Holt, H. N.		200
Naylor & Co.	328	9,906
Perkins, C. L.		1,400
Sachs & Richmond.		2
Whittemore, H. & Co.		40
Total	2,295	57,539
Corres. date, 1889.		40,612

Iron Ore.	Tons.	Tons.
Baiz, Jacob		67
Bowring & Archibald		3,092
Earnshaw, A.		3,193
Ennis, Andrew		438
Flores & Co., R. de		10,548
Johnson & Co., L.		5,030
Total		22,368
Corres. date, 1889.	237	7,970

EXPORTS.

Copper.	Pounds.	Pounds.
Abbott & Co., Jerc.	113,882	2,074,698
Amer. Met. Co., Ld.		881,808
Barber & Co		13,750
Belmont, Aug. & Co	314,411	1,768,974
Burgass & Co.		173,734
French, Edye & Co		135,374
Heidelbach, Sicheimer & Co		672,608
Seamen, S. H.		66,950
Ward, J. E. & Co.		100,000
Wil'ms & T'hune.		112,004
Total	428,293	5,999,900
Corre. date, 1889.	327,500	3,161,597

Copper Matte.		
American Metal Co	292,950	2,523,079
Lewisohn Bros.		1,500,103
Nichols, Geo. H.		267,202
Paulsen, Wm.		1,039,428
Wil'ms & T'hune.		2,848,706
Total	292,950	8,178,518
Corres. date 1889.	1,593,392	12,812,474

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied	Date and amount of last.			Dividends. Total paid.	Date and amount of last.		
1	Adams s. L.	Colo.	$1,500,000	150,000	$10	*	....	....	.....	$555 000	Jan	1887	10
2	Alice, s. c	Mont	10.000,000	400.000	25	*	....	....	.....	850,000	July	1890	.00¼
3	Alma&Nel Wood C.,c	Idah	300,000	30,000	10	....	....	....	.....	60,000	Jan	1 89	.50
4	American & Nettie,c.	Colo.	.....	300,000	..	*	....	....	.....	150,000	Nov	1889	10
5	Amy & Silverman,s.	Mon.	.....	341,419	..	.....	....	....	.....	247,530	Aug.	1887	1½
6	Atlantic, c	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	630,000	Feb	1890	1.50
7	Argenta, s	Nev..	10,000,000	100,000	100	33s,000	July	1889	.10	40.000	Feb.	1890	.20
8	Aspen Mg. & S., s. L.	Colo.	2,000.000	200,000	10	*	....	....	.....	440,000	Jun	1890	.10
9	Aurora, i	Mich	2,000,000	100,000	20	....	....	....	.....	155,000	Oct.	1887	1.87½
10	Badger, s	Ont.	250,000	50,000	5	....	....	....	.....	37,500	Mar.	1890	.25
11	Isasick, s. s	Colo.	10,000,000	100,000	100	*	....	....	.....	400,000	Mar.	1884	1.00
12	Belle Isle, s	Nev..	10,000,000	100,000	100	....	....	....	.....	300.00	Dec	1879	25
13	Belcher, G. s	Nev..	10,400,000	104,000	100	2,028,000	Apl.	890	.50	15,207,000	Apl.	1876	1.00
14	Bellevue Idaho, s. L.	Idah.	1,250.000	125,000	10	120,000	Dec.	1889	25	2 0.000	Jan.	1887	10
15	Bodie Con., G. s.	Cal.	10,000 000	100 000	100	575,000	Nov	1889	25	1,602,572	Apl.	1885	.50
16	Boston & Mont, G	Mon	2,500,000	250,000	10	*	....	....	.....	520.000	Jun	1890	.15
17	Boston & Mont., c.s.	Mon.	2,500,000	100,000	25	*	....	....	.....	1,300,000	May	1890	1.00
18	Breece, s	Colo	5,000,000	200,000	25	*	....	....	.....	2,000	Feb.	1880	.01
19	Brooklyn Lead, L. s.	Utah	500,000	50,000	10	....	....	....	.....	127,000	July	1887	.05
20	Bulwer, G	Cal.	10,000,000	100,000	10	130,000	Aug.	1889	.25	175 000	Jan.	1884	.10
21	Bunker Hill & Sull	Idah.	3,000,000	300,000	10	*	....	....	.....	150.000	Oct.	1883	.06⅔
22	Caledonia, G	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	160.000	Jun.	1890	.02
23	Calliope, s	Col.	1,000,000	.....	....	....	....	....	.....	90,000	Apl.	1890	.01
24	Calumet & Hecla, c	Mich	2,500,000	100,000	25	1,200,000	....	....	.....	34,350,000	May	1890	5.00
25	Carbonate Hill s. L.	Colo.	1,500,000	200,000	10	*	....	....	.....	80,000	Apl.	1884	.05
26	Carlisle, G	N. M	1,000,000	200,000	5	....	....	....	.....	175,000	Dec.	1888	12½
27	Castle Creek, G	Idah.	100.000	100,000	1	....	....	....	.....	51,000	Oct..	1883	.03
28	Cataipa, s. L	Colo.	3,000,000	300,000	10	*	....	....	.....	270,000	May.	1884	.10
29	Central, C	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,980,000	Feb.	1890	1.06
30	Chrysolite, s. L	Colo.	10,000,000	200,000	50	*	....	....	.....	1,650,000	Dec	1884	.25
31	Colorado Central, s. L	Colo.	2,750,000	275,000	10	*	....	....	.....	406,250	Aug.	1889	.05
32	Confidence, s. L	Nev..	.....	24,980	..	306,160	Mar.	1890	.75	199.680	Apl.	1889	1.00
33	Cons. Cal. & Va., G & L	Nev.	21 600 000	216.000	100	108,000	Jan.	1885	.20	3,466,800	Apl.	1890	.25
34	Contention, s	Ariz.	12,500.000	250,000	50	....	....	....	.....	18,537,500	Dec.	1884	.25
35	**Cop.-queen Cons,C.	Ariz.	1,400 000	140,000	10	....	....	....	.....	210,000	Feb.	1889	.50
36	Crescent, s. L	Utah	15,000,000	600,000	25	*	....	....	.....	228,000	Oct.	1888	.03
37	Crown Point, G. s	Nev..	10 000.000	100,000	100	2,850,000	Sept	1880	.50	11,580 000	Jan.	1875	2.00
38	Daly, s. L	Utah	3,000,000	150,000	20	*	....	....	.....	1,537 500	Jun.	1890	.25
39	Deer Creek, L. G	Idah.	1 000,000	200,000	5	....	....	....	.....	20,000	Jun.	1889	.05
40	Deadwood-Terra, G	Dak.	5,000,000	200,000	25	*	....	....	.....	11,000,000	Nov.	1887	.10
41	Derbec B. Grav., G. s.	Cal.	10,000,000	100,000	100	90,000	Dec.	1881	.10	210.000	Oct	1889	.10
42	Dunkin, s. L	Colo.	5,000,000	200,000	25	*	....	....	.....	390,000	Jun	1889	.05
43	Dunstone, G. s. L	Mont	1,,000,000	200,000	5	*	....	....	.....	6,000	Nov.	1888	.03
44	Eclipse	Colo.	100,000	100,000	1	....	....	....	.....	20,000	Nov.	1887	.10
45	Elkhorn, G. s	Mont	1,000,000	100,000	10	50,000	July	1883	.50	850,000	July	1887	.05
46	Empire L., G	Mont	500,000	100,000	5	....	....	....	.....	70.500	Oct.	1887	.37½
47	Eureka Con., G. s. L.	Nev..	5,000,000	50,000	100	550,000	Jun.	1889	.50	4,955.000	July	1888	.25
48	Evening Star, s. L	Colo.	500,000	50,000	10	*	....	....	.....	1,45 .000	Dec.	1889	.25
49	Excelsior, G. s	Cal.	10,000,000	100,000	100	500,000	Sept	1885	1.00	875.000	Oct..	1880	.25
50	Father de Smet, G.	Dak.	10,000,000	100 000	100	200,000	Nov	1878	1.00	1,125.000	Dec.	1885	.20
51	Franklin, C	Mich	1,000,000	40,000	25	220,000	Jun.	1871	....	960,000	Jan.	1889	2.00
52	Freeland, G. s. C	Colo.	5,000,000	200,000	25	*	....	....	.....	190,000	July	1886	.10
53	Garfield Lt., G. s	Nev.	500,000	100,000	5	....	....	....	.....	95,000	Apl.	1888	.12½
54	Gould & Curry, G. s	Nev..	10,300,000	103,000	100	4,465,800	Apl.	1890	.50	° 826,800	Oct.	1870	10.00
55	Grand Prize, s.	Nev..	10,000,000	100,000	100	715,000	Nov.	1889	.30	525,000	Jan	1890	.30
56	Granite, s. L	Idah.	500,000	500,000	1	....	....	....	.....	23.4 0	Oct.	1889	.02
57	Granite Mountain, s.	Mont	10,000,000	400,000	25	*	....	....	.....	8,400,000	Mar.	1890	.50
58	Green Mountain, G	Cal..	1,250,000	125,000	10	*	....	....	.....	212.000	Nov.	1881	.07½
59	Hale & Norcross, G. s	Nev	11,200,000	112,000	100	5,086,000	July	1887	.50	1,162.000	July	1888	.50
60	Hecla Con., s. G. L. C.	Mont	1,500,000	30,000	50	....	....	....	.....	1,500,000	Apl.	1889	.50
61	Hel's Mg. & Red,s.&L	Mont	3,315,000	993,000	5	....	....	....	.....	197,973	July	1886	.06
62	Holmes, s	Nev.	10,000,000	100,000	100	325,000	Mar.	1890	.25	75,000	Apl.	1886	.25
63	Holyoke, G	Utah	200,000	200,000	1	....	....	....	.....	27,000	Feb.	1883	.10
64	Homestake, G	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	5,556,250	Jun.	1890	.10
65	Honorine, s. L	Utah	500,000	250,000	2	37,500	Apl.	1889	.05	125.000	Sept	1887	.05
66	Hope, s	Mont	1,000,000	100,000	10	*	....	....	.....	233,252	Apl.	1885	.25
67	Horn-Silver, s. L	Utah	10,000,000	400,000	25	*	....	....	.....	4,150,000	Jun.	1890	.12½
68	Hubert, G	Colo.	1,000,000	1,000,000	1	....	....	....	.....	247.000	D	1889	.00½
69	Idaho, G	Cal..	310,000	3,100	100	....	....	....	.....	5,335,000	Dec.	1889	5.00
70	Ideal, s. L	Colo.	1,500,000	50,000	10	....	....	....	.....	15.000	Oct.	1886	.05
71	Illinois, s	N. M.	100,000	100,000	1	....	....	....	.....	45,000	Apl	1889	.20
72	Independence, s	Nev..	10,000,000	100,000	100	340,000	Oct.	1886	.20	225.000	Sept	1879	.25
73	Iron Hill, s	Dak.	2,500,000	250,000	10	134,000	July	1889	.03	156,250	Nov	1887	.07½
74	Iron-Silver, s. L. c	Colo.	10,000,000	100,000	100	*	....	....	.....	2,500.000	Apl.	1889	.20
75	Jackson, G. s	Nev	5,000,000	50,000	100	287,500	Nov	1880	.20	55,000	Jun	1880	.10
76	Jay Gould,	Mont	2,000,000	40,000	5	....	....	....	.....	495,000	May	1890	.04
77	Jocuistita, G	Mex.	2,500,000	250,000	10	*	....	....	.....	1,300,000	Feb.	1880	.50
78	Jumbo, G	Colo.	2,000,000	200,000	10	....	....	....	.....	35.000	Oct.	1887	.02½
79	Kearsarge, C	Mich	1,250,000	50,000	25	190,000	Oct.	1887	1.60	100,000	Jan	1890	2.00
80	Kentuck	Nev.	3,000,000	300,000	10	369,000	Dec.	1889	.30	1,350,000	Dec.	1884	.10
81	La Plata, s. L	Colo.	2,000,000	200,000	10	*	....	....	.....	610,000	Sept	1889	.30
82	Leadville Cons., s. L.	Colo.	4,000,000	100,000	10	*	....	....	.....	423,000	Apl.	1889	.05
83	Lexington, G. s	Mont	4,000,000	40,000	100	*	....	....	.....	609,000	Jan.	1885	2.00
84	Little Chief, s. L	Colo.	10,000,0	200,000	50	*	....	....	.....	810,000	Jan.	1890	.05
85	Little Pittsburg, s. L	Colo.	20,000,000	200,000	100	*	....	....	.....	1,050,000	Mch.	1889	.50
86	Martin White, s	Nev..	10,000,000	100,000	100	100,000	Feb.	1890	.25	140.000	Dec.	1888	.25
87	Mary Murphy, G. s	Colo.	350,000	3,500	100	*	....	....	.....	175,000	May	1888	5.00
88	Matchless, s	Colo.	500.000	500,000	1	....	....	....	.....	15,000	Feb.	1890	.00½
89	May Maseppa	Colo.	1,000,000	100,000	1	....	....	....	.....	10.000	July	1890	.01
90	Minnesota, C	Mich	1,000,000	40,000	25	420,000	Apl.	1886	1 00	1,826,000	Mar.	1876	....
91	Mono, G	Cal.	5,000,000	50,000	100	102,850	Nov.	1889	.25	12.500	Mar.	1886	.25
92	Montana, Lt., G. s	Mont	2,300,000	640,000	5	*	....	....	.....	2,465,129	Apl.	1890	.06
93	Morning Star, s. L	Colo.	1,000,000	100,000	10	....	....	....	.....	850,000	Dec.	1889	.30
94	Moulton, s. G.	Mont	2,000,000	400,000	5	*	....	....	.....	280,000	Dec.	1887	.07½
95	Mount Pleasant, G	Cal.	150,000	150,000	1	....	....	....	.....	150.000	Feb.	1887	.30
96	Mt. Diablo, s	Nev.	5,000,000	50,000	100	137,500	Jun.	1880	2.00	160,000	Oct	1889	.20
97	Napa, Q	Cal..	700,000	100,000	7	....	....	....	.....	36.000	Apl.	1890	.10
98	Navajo, G. s	Nev..	10,000,000	100,000	100	485,000	Apl.	1888	.30	365,000	Apl.	1889	.10
99	New Guston, s	Colo.	500,000	100,000	5	*	....	....	.....	287,500	Dec.	1889	.07½
100	N. Hoover Hill, G. s.	N. C.	300,000	120,000	2½	*	....	....	.....	30.000	Dec.	1885	99½
101	Northern Belle, s	Nev..	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	Apl.	1882	.50
102	North Belle Isle, s	Nev..	10,000,000	100,000	100	400,000	Sept	1889	.20	230,000	May	1888	.50
103	North Star, G	Cal..	1,000,000	100,000	10	....	....	....	.....	250.000	Dec.	1889	.50
104	Ontario, s. L	Utah	15,000,000	150,000	100	*	....	....	.....	11,075,000	Jun	1890	.50
105	Optic, G. s	Colo.	10,000,000	100,000	100	4,159,440	May	1889	.50	1,005,800	July	1889	1.00
106	Original, s. C	Mont	1,500,000	60,000	25	*	....	....	.....	120,000	July	1888	.05
107	Osceola, C	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,322,300	Jun.	1890	1.00
108	Oxford, G	N. S.	125.000	125,000	1	*	....	....	.....	78,500	Sept	1888	.02
109	Paradise Valley, G. s	Nev.	10,000,000	100,000	100	57,000	Apl.	1888	.15	150.000	Apl	1887	.10
110	Parrot, C	Mont	1,800,000	180,000	10	....	....	....	.....	588,000	May	1890	.10
111	Peacock, s. G	N. M.	2,000,000	200,000	10	*	....	....	.....	60,000	Nov.	1886	....
112	Plumas Eureka, G	Cal..	1,400,350	140,035	10	*	....	....	.....	2,548,000	Oct.	1889	.37½
113	Plutus, G. s. C. L	Colo.	2,000,000	200,000	10	*	....	....	.....	20,000	Feb.	1886	.10
114	Plymouth Con., G	Cal..	5,000,000	100,000	50	*	....	....	.....	2.280.000	Feb.	1885	.40
115	Quicksilver, pref., Q.	Cal..	4,300,000	43,000	100	....	....	....	.....	1,641,422	May	1890	1.50
116	com., Q.	Cal..	5,700,000	57,000	100	....	....	....	.....	643,357	July	1882	.40
117	Quincy C	Mich	1,000,000	40,000	25	200,000	Dec.	1862	....	5,370,000	Jan	1890	3.00
118	Republic, G	Mich.	5,000,000	100,000	50	400,000	Dec.	1889	.30	4,312,587	Mar.	1887	1.25
119	Richmond, s. L	Nev.	1,350,000	54,000	25	*	....	....	.....	99.785	Feb.	1880	.50
120	Ridge, C	Mich.	500,000	20,000	25	219,939	Mar	1886	.50	585,000	Mar.	1886	.05
121	Robinson Con., s. L	Colo.	10,000,000	200,000	50	*	....	....	.....	100,000	Dec.	1882	.50
122	Robert E. Lee, s. L	Colo	10,000,000	500,000	20	....	....	....	.....	4,460,000	July	1889	3.00
123	Savage, s	Nev..	11,200,000	112,000	100	6,542,000	July	1889	.50	7,500	Apl.	1883	.01
124	Shoshone, s	Idah.	150,000	150,000	1	....	....	....	.....	1,568,145	Apl.	1888	.12½
125	Sierra Buttes, G	Cal.	2,325 000	122,500	10	*	....	....	.....	102,000	Jan.	1871	1.00
126	Sierra Nevada, G. s.	Nev..	10,000,000	100,000	100	6,250,000	Oct.	1889	.50	270,000	Apl.	1889	.10
127	Sierra Nevada, s. L	Idaho	1,000,000	¶ 1	....	*	....	....	.....	40,000	May	1889	.02
128	Silver Cord, G. s. L	Colo.	4,500,000	450,000	10	*	....	....	.....	270,000	Apl	1889	.10
129	Silver King, s	Ariz.	10,000,000	100,000	100	80,000	Jan.	1890	.30	1,950,000	July	1887	.25
130	Silver Mg. of L., V	N. M.	500,000	500,000	1	....	....	....	.....	100.000	Apl.	1890	.05
131	Silverton, s. L	Colo.	2,000,000	200,000	10	*	....	....	.....	50,000	Jan	1881	.25
132	Small Hopes Cons., s.	Colo.	5,000,000	250,000	20	*	....	....	.....	3,137,500	Jun	1889	.10
133	Spring Valley, G	Cal..	200,000	200,000	1	50,000	Oct.	1886	.25	3,595,000	Jun.	1888	.05
134	Standard, G. s	Cal..	10,000,000	100,000	100	50,000	Feb.	1890	.25	155,000	Nov.	1881	.05
135	Stormont, s	Utah	500,000	500,000	1	*	....	....	.....	844.00	Dec.	1887	.20
136	St. Joseph, L	Mo.	1,500,000	150,000	10	*	....	....	.....	9,000	Apl.	1888	.02½
137	Swansea, G	Colo.	600,000	60,000	10	*	....	....	.....	100,000	Nov	1881	.20
138	Tamarack, C	Mich.	1,000,000	40,000	25	520,000	Apl.	1885	3.00	1,560,000	July	1890	3.00
139	Tip Top, s	Ariz.	10,000,000	100,000	100	250,000	Sept	1883	.25	1,250,000	Apl	1884	.20
140	Tombstone, G. s. L.	Ariz.	12,500,000	500,000	25	*	....	....	.....	97,500	Feb.	1886	2.50½
141	United Verde, G	Ariz.	3,000,000	300,000	10	*	....	....	.....	37,500	Apl	1888	.37½
142	Valencia, s	N. M.	150,000	1,500	100	*	....	....	.....	272,500	Oct.	1887	.10
143	Viola Lt., s. L	Idah.	750,000	150,000	5	*	....	....	.....	1,275,000	July	1889	.05
144	Ward Cons., s. L	Colo.	2,000,000	200,000	10	....	....	....	.....	20,000	Dec.	1871	1.50
145	Yankee Girl	Colo.	2,500,000	250,000	10	*	....	....	.....	2,184,000	Aug	1889	.10
147	Yellow Jacket, G. s.	Nev..	12,000,000	120,000	100	5,500,000	Mar	1889	.50	3,300	Jun	1889	.10
148	Webb City, L. Z	Mo..	55,000	11,000	5	....	....	....	.....	25.000	Oct.	1889	.25
149	Woodside	Utah	.....	.....	....	....	....	....	.....	175,000	....	1889	.10
141	Young America	Cal..	.....	.....	....	....	....	....	.....	.....	....	....	.....

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par Value.	Assessments. Total levied	Date & am't of last.		
1	Agassis Cons., s. L	Colo.	$2,500,000	50,000	$50	*	....	....	....
2	Alleghany, s	Colo.	5,000,000	500,000	10	....	....	....	....
3	Allouez, c	Mich	2,000,000	80,000	25	$737,000	Jan.	1890	.50
4	Alpha Con., G. s.	Nev..	3,000,000	30,000	100	5s3.750	July	1886	.07½
5	Alta, s	Cal..	10,080,000	100,800	100	2,248,800	Sept	1888	.60
6	Amador, G	Cal..	600,000	200,000	3	*	....	....	....
7	American Flag, s	Colo.	1,250,000	125,000	10	300,000	Jun	1877	.10
8	Amity, s	Colo.	250,000	250,000	1	....	....	....	....
9	Angio-Montana, Lt.	Mon.	600,000	120,000	5	*	....	....	....
10	Astoria, G	Cal..	200,000	100,000	2	....	....	....	....
11	Barcelona, G	Nev..	5,000,000	200,000	25	*	....	....	....
12	Bechtel Con., G	Cal..	10,000,000	100,000	100	173,500	Jan.	1883	.10
13	Belmont, s	Nev.	5,000,000	50,000	100	735.000	Apl.	1886	.10
14	Best & Belcher, G. s.	Nev..	10,080,000	100,800	100	2,180,590	Jan.	1890	.25
15	Big Pittsburg, G. s.	Colo.	20,000,000	200,000	100	*	....	....	....
16	Bi-Metallic, s	Mon.	5,000,000	200,000	25	*	....	....	....
17	Black Oak, G	Cal.	3,000,000	300,000	10	*	....	....	....
18	Boston Con., G	Cal.	10,000,000	100,000	100	170,000	Nov	1888	.25
19	Bremen, s	N. M.	5,000,000	500,000	10	*	....	....	....
20	Brownlow, s	Colo.	250,000	250,000	1	....	....	....	....
21	Brunswick, G	Cal..	2,000 000	400,000	5	*	....	....	....
22	Bullion, G. s.	Nev..	10,000,000	100,000	100	4,007,000	Aug.	1888	.80
23	Calaveras, G	Cal..	500,000	500,000	1	*	....	....	....
24	Carisa, G	Wy	500,000	100,000	5	*	....	....	....
25	Carupano, G. s. L. C.	Ven.	200,000	100,000	2	*	....	....	....
26	Cashier, G. s.	Colo.	500.000	250,000	2	*	....	....	....
27	Charles Dickens,G.s.	Idah.	1,250.000	250,000	5	*	....	....	....
28	Cherokee, G	Cal..	1,500,000	150,000	10	....	....	....	....
29	Chollar, s	Nev.	11,200,000	112,000	100	1,484,000	July	1889	.50
30	Cleveland, T	Dak.	1,000,000	500,000	2	*	....	....	....
31	Colchis	N. M	500,000	50,000	10	....	....	....	....
32	Commonwealth, s	Nev.	10,000,000	100,000	100	170,000	Nov	1888	.50
33	Comstock, G. s	Nev..	10,000,000	100,000	100	30 000	Mar.	1887	.15
34	Con. Imperial, G. s.	Nev..	5,000,000	50,000	100	1,802,500	Nov.	1889	.05
35	Con. Pacific, G	Cal..	6,000 000	60,000	100	192,000	Oct.	1889	.10
36	Crest, Silver, s	Mon..	2,500,000	250,000	10	....	....	....	....
37	Crescent, s. L	Colo.	3,000,000	300,000	10	*	....	....	....
38	Crocker, s	Ariz.	10,000,000	100,000	100	135,000	Jan.	1890	.10
39	Crowell, G	N. C.	500,000	500,000	1	*	....	....	....
40	Dahlonega, G	Ga..	250,000	250,000	1	*	....	....	....
41	Dandy, s	Colo.	5,000,000	500,000	10	....	....	....	....
42	Decatur, s	Colo.	1,500,000	300,000	5	*	....	....	....
43	Denver City, s. L	Colo.	5,000,000	500,000	10	*	....	....	....
44	Denver Gold, G	Colo.	300,000	60,000	5	....	....	....	....
45	Durango, G	Colo.	500.000	500,000	1	*	....	....	....
46	Eastern Dev.Co., Lt.	N. S.	1,500,000	150 000	10	990,000	Mar.	1886	L.0
47	El Cristo, G. s	U.S.C	1,000,000	500,000	2	*	....	....	....
48	El Dorado, G	Cal..	1,000,000	250,000	4	*	....	....	....
49	El Tesoro, G	U.S.C	1,500,000	300,000	5	*	....	....	....
50	Empire, s	Utah	10,000,000	100,000	100	*	....	....	....
51	Eureka Tunnel, s. L.	Nev..	10,000,000	100,000	100	....	....	....	....
52	Exchequer	Nev	10,000,000	100,000	100	575,000	Apl.	1889	.25
53	Found Treasure, G. s.	Nev..	10,000,000	100,000	100	30,500	Apl	1889	2½
54	Gogebic L. Syn., I	Wis.	5,000,000	200,000	25	*	....	....	....
55	Golden Era	Colo.	500,000	500,000	1	*	....	....	....
56	Golden Era	Mon.	2 000,000	200,000	10	*	....	....	....
57	Gold Placer, G	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.25
58	Gold Rock, G	Cal.	1,000,000	500,000	2	*	....	....	....
59	Goodshaw, G	Cal..	10,000,000	100,000	100	*	....	....	....
60	Grand Belt, G	Tex.	12,000,000	120,000	100	....	....	....	....
61	Grand Cache, G	Colo.	300,000	60,000	10	*	....	....	....
62	Great Romance, G	U.S.C	1,000,000	500,000	2	*	....	....	....
63	Gregory-Bobtail, G	Colo.	550,000	550,000	1	*	....	....	....
64	Gregory Con., G	Mon.	3,000,000	300,000	10	*	....	....	....
65	Harlem M. & M.Co,G.	Cal.	¥ 000,000	200,000	5	....	....	....	....
66	Head Cent. & Tr.s.G	Ariz.	10,000,000	100,000	100	....	....	....	....
67	Iron Age, G	Cal.	1,500,000	300,000	5	45,000	Jan.	1889	.15
68	Highland, G	Mich	500,000	25,000	20	*	....	....	....
69	Hollywood	Cal..	200,000	100,000	2	....	....	....	....
70	Hortense, s	Colo.	2,000,000	200,000	10	*	....	....	....
71	Huron, C	Mich	1,000,000	40,000	25	280,000	May	1887	5.00
72	Iron Gold & Silver, s	N. M.	2,000,000	200,000	10	*	....	....	....
73	Ironton, i	Wis.	1,000,000	40,000	25	*	....	....	....
74	Jackson, G	Mich.	1,250,000	50,000	25	*	....	....	....
75	J. D. Reymers	Ariz.	10,000,000	400,000	100	....	....	....	....
76	Julia Cons., G. s.	Nev..	11,000,000	110,000	100	1,660,000	Jan.	1889	.10
77	Lacrosse, G	Colo.	1,000,000	100,000	10	*	....	....	....
78	Lee Basin, s. L	Colo.	5,000,000	500,000	10	*	....	....	....
79	Mayflower Gravel	Cal..	1,000,000	100,000	10	585,000	Mar.	1890	.50
80	Medora, G	Dak.	250,000	250,000	1	*	....	....	....
81	Mexican, G. s	Nev..	10,000,000	100,000	100	2,800,760	Dec.	1889	.25
82	Middle Bar G	Cal.	400,000	200,000	2	*	....	....	....
83	Mike & Starr, s. L	Colo.	1,000,000	200,000	5	*	....	....	....
84	Mollie Gibson	Colo.	2,000,000	1,000,000	2	*	....	....	....
85	Monitor, G	Colo.	100,000	100,000	1	*	....	....	....
86	Mutual Mg. & Sm.	Wah	10 0,000	100,000	1	*	....	....	....
87	Nadmo, G	Mich	1,000,000	40,000	25	*	....	....	....
88	Neath, G	Colo.	1,000,000	100,000	10	....	....	....	....
89	Nevada Queen, s	Nev	10,000,000	100,000	100	250,000	Oct.	1889	.25
90	New Germany, G	N. S.	100,000	100,000	1	*	....	....	....
91	New Pittsburg, s. L	Colo.	2,000,000	200,000	10	*	....	....	....
92	N. Commonw'lth, s	Nev.	10,000,000	100,000	100	60,000	Apl	1889	....
93	North Standard, s. L	Cal..	10,000,000

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	§July 5. H.	§July 5. L.	July 7. H.	July 7. L.	July 8. H.	July 8. L.	July 9. H.	July 9. L.	July 10. H.	July 10. L.	July 11 H.	July 11 L.	SALES.
Adams, Colo.	...	.....	....	....	...	....	....	....	....	....	....	....	.....
Alice, Mont.	....	.....	....	....	...	....	....	....	....	....	....	....	.....
Argenta, Nev.	....	.....	....	....	...	....	....	....	....	....	....	....	.....
Aspen Mg, Colo	....	.....	....	....	...	....	....	....	....	....	....	....	.....
Belcher	....	.....	....	....	...	....	....	....	....	....	....	....	.....
Belle Isle, Nev.	....	.....	1.80	....	1.60	....	....	....	1.70	....	1.60	....	500
Bodie Cons., Cal	....	.....	....	....	....	....	1 20	....	....	....	....	....	100
Bos. & Mont., Mont.	....	.....	....	....	...	....	....	....	....	....	....	....	.....
Breece, Colo.	....	.....	....	....	.23	....	....	....	....	....	....	....	3 0
Bulwer, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Caledonia	....	.....	....	....	....	....	....	....	2.00	....	....	....	1,000
Chryso lite, Colo.	....	.....	....	....	....	....	....	....	.31	....	....	....	100
Colorado Central	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Confidence, Nev	....	.....	....	....	....	....	4.25	....	....	....	....	....	100
Cons. Cal. & Va., Nev.	...	.....	5.00	....	...	....	4 85	....	....	....	....	....	200
Crown Point, Nev	....	2	3.05	....	....	....	3 25	....	....	....	....	....	200
Deadwood, Dak	....	....	....	....	....	....	....	....	1.40	....	....	....	400
Dunkin, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Eureka Con	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Excelsior, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Father de Smet	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Freeland, Colo.	....	.....	.43	.40	....	....	.49	.48	.50	....	....	....	4,600
Gould & Curry, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Hale & Norcross, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Homestake, Dak	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Horn-Silver, Ut.	....	.....	3.30	....	3.30	....	....	....	3.30	....	3.25	3 30	63
Independence, Nev.	....	.....	....	....	....	....	....	....	....	....	.28	.25	200
Kentuck, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Leadville C., Colo.	....	.....	.12	....	.12	....	.13	.12	.14	.13	.16	.13	16,500
Little Chief Colo	....	.....	....	....	.36	.34	.35	....	....	....	....	....	1,200
Martin White, Nev	....	.....	....	....	....	....	....	....	1.10	....	1.00	....	500
Mono, Cal	....	.....	....	....	.65	....	.60	....	.60	....	....	....	200
Mt. Diablo, Nev	....	.....	2.25	....	....	....	....	....	....	....	....	....	100
Navajo, Nev.	....	.....	....	....	.65	.60	.75	.70	.75	....	....	....	2,000
North Belle Isle, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
North Star, Cal.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Ontario, Ut.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Ophir, Nev.	....	.....	....	....	4.60	....	4.50	....	....	....	....	....	200
Osceola, Mich	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Plymouth, Cal.	....	.....	....	....	7.00	....	7.00	....	....	....	....	....	200
Quicksilver, Pref	....	....	....	....	42.00	....	43.00	....	41.50	....	41.75	41.63	475
" Com.	....	....	....	....	....	....	....	....	7.00	....	....	....	100
Quincy, Mich.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Robinson Cons. Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Savage, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Sierra Nevada, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Silver Cord.	....	.....	....	....	....	....	....	....	.30	....	....	....	100
Silver King	....	.....	.42	....	....	....	.44	4.20	....	....	....	....	1,100
Silver Mg. of L. V.	....	.....	....	....	.75	.70	....	....	....	....	....	....	1,000
Small Hopes, Colo.	....	.....	....	....	....	....	....	....	95	....	....	....	500
Standard, Cal	....	.....	....	....	....	....	....	....	.94	4 09	....	....	175
Stormont, Utah	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Yellow Jacket, Nev	....	.....	....	....	....	....	....	....	3.35	....	....	....	100

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 5. H.	July 5. L.	July 7. H.	July 7. L.	July 8 H.	July 8 L.	July 9 H.	July 9 L.	July 10 H.	July 10 L.	July 11 H	July 11 L.	SALES.
Alloues, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Alta, Nev.	....	....	1.40	....	....	....	1.35	....	....	....	....	....	500
Andes, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Amador, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
American Flag, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Astoria, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bechtel	....	....	....	....	....	....	20	....	....	....	....	....	400
Best & Belcher, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bonanza King, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Brunswick, Cal.	....	....	.97	.95	.95	.75	.75	....	....	....	....	....	8 600
Bullion, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Butte & Bost., Mont.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Castle Creek, Id.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Chollar, Nev	....	....	....	....	....	....	....	....	....	....	3.90	....	100
Col & Beaver, Id.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Commonwealth, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Comstock T., Nev.	....	....	.17	....	....	....	....	....	....	....	....	....	500
" bonds.	....	....	....	....	....	....	....	....	....	....	....	....	.....
" scrip	....	....	....	....	....	....	....	....	....	....	.28	....	100
Con. Imperial, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Denver City, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
El Cristo, Rep. of Col	....	....	.95	....	....	....	....	....	....	....	....	....	100
Exchequer	....	....	....	....	....	....	....	....	....	....	....	....	.....
Huron, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Julia, Nev.	....	....	....	....	.50	....	.50	....	.50	....	.50	....	1,000
Justice Nev.	....	....	....	....	....	....	1.50	....	....	....	....	....	200
Kingst'n & Pemb'ke	....	....	....	....	....	....	....	....	....	....	....	....	100
Lacrosse, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	100
Lee Basin, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mexican Nev	....	....	3.15	....	3.50	....	3.25	....	....	....	....	....	400
Minn Iron Co., Mich	....	....	....	....	86.00	....	85 00	....	....	....	....	....	110
Monitor	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mutual Sm. & M. Co	....	....	1 60	....	1.55	....	1.55	....	1.60	....	1.60	....	1,300
Nevada Queen, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
N. Com'nw'th, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Occidental, Nev.	....	....	....	....	....	....	....	....	....	....	1.50	....	200
Oriental & Mill, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Overman, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Phoenix of Ariz.	....	....	1.30	1 25	1 30	1 25	1.25	1.20	1.30	....	1 34	1.30	7,950
Potosi, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Rappahann'k, Va	....	....	....	....	....	....	.05	....	.05	....	.05	....	2,600
Ruby S. M. Co., bds.	....	....	....	....	....	....	....	....	10½	....	....	....	10
Santiag. U. S. C.	....	....	....	....	....	....	....	....	....	....	....	....	.....
S. Sebastian	....	....	....	....	....	....	....	....	....	....	....	....	.....
Scorpion	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Queen	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sutro Tunnel, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
" Trust Cert.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sutter Creek, Cal.	....	....	1.15	1.10	1.10	....	1.10	1 00	1.05	1.00	1.00	....	2,900
Tioga, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Union Cons., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Utah, Nev.	1.20	....	1 20	....	....	....	1 20	....	1.20	....	1.20	....	600
Wall St M. & M. Co.	....	....	....	....	....	....	....	....	....	....	....	....	.....

*Ex dividend. †Dealt in at the New York Stock Ex. Unlisted securities. ‡Assessment unpaid. Dividend shares sold, 32,318 Non-dividend shares sold 36,170. Total, New York, 68,48. §Holiday.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	July 3.		July 5.*		July 7.		July 8.		July 9.		July 10.		SALES.
Atlantic, Mich.	26.00	25.50	....	....	26.00	....	....	....	25 50	....	25.50	25.00	980
Bodie, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bonanza Developm't	1.10	1.00	....	....	....	....	....	....	....	....	....	....	425
Bost. & Mont., Mont.	67.0	65 88	....	....	67.00	65.00	65.00	....	64 50	64 00	64.00	63.00	2,583
Breece, Colo.	.41	....	....	....	40	....	....	....	41	40	.45	43	4,950
Calumet & Hecla, Mich.	310	308	....	....	310	309½	310	30	310	309	310	308	296
Catalpa, Colo.	.44	.43	....	....	.43	....	....	....	....	....	....	....	1,500
Central, Mich.	....	....	....	....	....	....	....	....	.30	....	....	....	10
Chrysolite, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Con. Cal. & Va., Nev.	....	....	....	....	....	....	....	....	4.75	....	....	....	10
Dunkin, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Eureka, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Franklin, Mich.	23 50	23.00	....	....	23.75	..	24.00	23.50	24.00	23 25	24.00	23.25	2,229
Freeland, Col.	.45	....	....	....	....	....	....	....	....	....	....	....	400
Kearsarge	33.50	29.88	....	....	33.50	31.63	32.00	31.25	31.00	27.00	28 75	27.00	14,850
Little Chief, Colo	.40	.38	....	....	.38	....	....	....	.37	....	....	....	3,100
Little Pittsburg, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Martin White, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Moulton	....	....	....	....	....	....	....	....	....	....	....	....	.....
Napa, Cal.	....	....	....	....	5 00	....	....	....	....	....	....	....	150
Ontario, Utah	....	....	....	....	....	....	....	....	....	....	....	....	.....
Osceola, Mich.	47 88	....	....	....	46.50	....	46.25	46.00	46. 0	45.75	45 50	44.50	720
Pewabic, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Quincy, Mich.	125	....	....	....	....	....	125	....	124	....	121	....	237
Ridge, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sierra Nev., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver King	....	....	....	....	....	....	....	....	....	....	....	....	.....
Stormont, Utah	....	....	....	....	....	....	....	....	....	....	....	....	.....
Tamarack, Mich.	212½	....	....	....	217	215	215	....	212	....	210	....	143

NAME OF COMPANY	July 3.		July 5*		July 7.		July 8		July 9		July 10.		SALES.
Alloues, Mich.	10 25	9.13	....	....	10.25	9.50	10.00	9.50	9.75	9 38	9 88	9 63	13,375
Arnold, Mich.	2.00	1 75	....	....	1.75	1.63	2 25	1.50	1.75	....	2.00	....	1,625
Aztec, Mich.	.38	....	....	....	....	....	.40	....	.40	....	....	....	600
Bowman S., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Butte & Bost., Mont	24 50	24 13	....	....	24 38	24 63	24 50	....	24 50	24.00	23.38	23 00	1,465
Centennial, M ch.	38.00	....	....	....	38 38	38 25	38.13	38.00	38 50	37.50	39 00	37 50	2,065
Contentment, Mich.	.04	....	....	....	....	....	....	....	....	....	....	....	1,500
Copper F ll Mg	....	....	....	....	....	....	....	....	....	....	11 00	....	100
Crescent, Colo.	19	....	....	....	.17	....	....	....	....	....	....	....	1,000
Dana, M ch	....	....	....	....	.45	....	.40	....	.41	....	....	....	600
Don Enrique, N. M.	....	....	....	....	....	....	....	....	....	....	....	....	.....
El Cristo, S. A	.85	....	....	....	....	....	....	....	85	....	....	....	300
Hanover, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Humboldt, Mich.	.50	....	....	....	....	....	.45	....	.45	....	....	....	500
Hungarian, Mich	60	.58	....	....	.60	.55	.60	....	.60	....	....	....	1,800
Huron, Mich.	3 88	3.25	....	....	†8.50	3 50	†9.13	†8.50	....	....	†9.25	49.00	2,665
Mesnard, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
National, Mich.	....	....	....	....	2.25	2 00	2 50	2.00	2 38	....	2.25	....	1,890
Native, Mich.	....	....	....	....	29	.28	.30	....	.30	....	....	....	1,400
Or ental & M., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Phoenix	1 30	....	....	....	....	....	....	....	....	....	....	....	200
Pontiac	....	....	....	....	....	....	....	....	....	....	....	....	.....
Rockland	....	....	....	....	....	....	....	....	....	....	....	....	.....
Santa Fe, N. Mex.	.70	.68	....	....	.75	....	.80	....	.83	.75	.75	....	6,900
Shoshone Idaho	....	....	....	....	....	....	....	....	....	....	....	....	.....
South Side, Mich	.38	.30	....	....	33	....	.33	....	....	....	....	....	9 0
Star	.40	....	....	....	....	....	....	....	.40	....	....	....	3 0
Tecumseh Mg. Co.	....	....	....	....	....	....	9.10	8.00	9.00	8.00	8.00	....	1,105
Washington, Mich	.53	....	....	....	.53	....	....	....	48	....	....	....	500

* Holiday. † Assessment paid. Boston: Dividend shares sold, 32,603 Non-dividend shares sold, 40,790 Total Boston, 73,393

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	*July 5. H.	*July 5. L.	Ju y 7. H.	Ju y 7. L.	July 8 H.	July 8 L.	July 9 H.	July 9 L.	July 10 H.	July 10 L.	July 11. H.	July 11. L.	Sales.
American Coal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cambria Iron.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal & Iron Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ches. & O. RR.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chic. & Ind. Coal RR.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. & Hocking Coal	100	.....	.....	32⅜	31⅞	.....	.....	31⅞	.....	31⅛	.....	.....	.....	400
Col., C. & I	100	.....	.....	.....	.....	51⅜	51¼	50⅜	50⅛	50⅛	50⅛	51⅛	51¼	1,000
Consolidation Coal.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C.	100	.....	.....	169¼	169	169	168¾	.....	.....	.....	.....	169½	169	560
D., L. & W. RR.	50	.....	.....	145¾	144½	146¾	145⅝	146¾	146⅜	147⅛	145⅝	148½	147⅛	106,992
Hocking Valley	100	.....	.....	28¾	28½	28¼	.....	28½	27⅝	29	27⅝	28⅞	28⅝	6,280
Hunt. & Broad Top	.....	.....	.....	23	.....	.....	.....	25	.....	.....	.....	.....	.....	200
Do. pref	.....	.....	.....	49	48⅜	49	.....	49¼	49	49⅜	49⅛	.....	.....	2,215
Illinois Coal & Coke Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lehigh C. & N.	50	.....	.....	52	.....	52¼	.....	52¼	52⅛	52⅝	52¼	.....	.....	569
Lehigh Valley RR.	50	.....	.....	53	52⅛	53¼	53	53¼	53	53⅛	52⅞	.....	.....	1,870
Lehigh & Wilkesb. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mahoning Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marshall Con. Coal.	.....	.....	.....	1	⅛	.....	.....	.....	.....	.....	.....	1	.....	715
Maryland Coa	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex.	100	.....	.....	.....	.....	.....	.....	154	153⅛	.....	.....	.....	.....	333
New Central Coal.	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. J. C. R. & R.	100	.....	.....	124½	124	126⅛	124⅛	.....	.....	126	125½	126⅛	126	2,432
N. Y. & S. Coal.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., Susq. & Western	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	33	.....	100
N. Y. & Perry C. & I.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk & Western RR.	50	.....	.....	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	10
Do. pref.	50	.....	.....	.....	.....	61⅝	.....	61¼	61¼	.....	.....	62	.....	750
Penn. Coal.	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR.	50	.....	.....	54	53¾	53⅞	53¾	53¾	53⅝	.....	.....	.....	.....	3,156
*Ph. & R. RR.	.....	.....	.....	46¾	46⅝	47⅛	46⅞	46¾	45¾	46⅜	46⅛	46⅝	46⅜	**74,928
Sunday Creek Coal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee C. & I. Co.	.....	.....	.....	51	.....	5 ⅛	50¾	.....	.....	51⅛	..	51	50¼	1,500
Do. pref.	.....	.....	.....	.....	.....	105	.....	.....	.....	.....	.....	.....	.....	5
Westmoreland Coal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Holiday. **Sales in New York, 35,350; in Philadelphia, 39,578. Total sales, 204,815.

San Francisco Mining Stock Quotations.

COMPANY	CLOSING QUOTATIONS. July 3.	July 5*	July 7.	July 8.	July 9.	July 10.
Alpha	.....	.....	.....	.....	.....	.....
Alta	1.25	.....	1.35	1.30	1.25	1.25
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle	1.80	.....	.85	1.60	1.75	1.60
Best & Bel.	5.45	.....	4.00	4.05	4.05	3.90
Bodie	1.00	.....	1.10	1.10	1.10	1.05
Bulwer	.25	.....	.30	.25	.25	.25
Challar	3 55	.....	4.20	3.80	4.00	3.70
C'm'weal'h	3.25	.....	3 35	.....	3.50	3.25
Con. C. & V	4.80	.....	4.75	4.50	4.50	4.50
Con. Pac.	.....	.....	.....	.....	.....	.....
Crown Pt.	2.80	.....	3.25	2.95	3.05	3.00
Eureka C.	.....	.....	.....	.....	.....	3.50
Gould & C.	2.35	.....	2.65	2.60	2.65	2.55
Grd. Prize.	.....	.....	.....	.....	.....	.....
Hale & N.	2.90	.....	3.40	3.05	3.15	4.05
M. White.	.....	.....	.....	.....	.....	.....
Mexican.	3.20	.....	4.70	3.25	3.45	3.25
Mono.	.70	.....	.75	.70	.60	.60
Mt Diablo	2.10	.....	2 10	2.10	.....	.....
Navajo	.55	.....	.60	.65	.70	.75
Nev. Queen	.85	.....	.85	.85	.90	.90
N. Belle I	1.45	.....	1.45	1.40	1.45	1.40
Occidental	.....	.....	.....	.....	.....	.....
Ophir.	4.50	.....	4.50	4 40	4.50	4.40
Potosi.	7.88	.....	8.25	7 75	7.90	7.25
Savage	4.10	.....	3.40	4.20	4 10	4.20
Sierra Nev	3.35	.....	3.50	4.35	3.65	3.45
Union Con	2 75	....	2.90	2 85	3 10	2.95
Utah	1 05	.....	1.10	1.05	1.10	1.05
Yellow Jk	4.90	.....	3.30	3.10	3.25	3.05

*Holiday.

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid. L. H.	Asked. L. H.
Atlantic Coal	$ 95@$1.00	$1.25@$1.50
Balt. & N. C.	....	10
Big Vein Coal	....	....
Conrad Hill	05	08
Cons. Coal	26	27½
Diamond Tunnel	....	....
George's Crk. C.	1.10	1.25
Lake Chrome	....	....
Maryland & Charlotte	....	....
North State	10	..
Silver Valley	40	50

Prices bid and asked, lowest and highest, during the week ending July 9.

Birmingham, Ala.

COMPANY.	Bid. L. H.	Asked. L. H.
Ala. R. Mill Co.	....	$60
*Alice Furnace	$103	....
Anna Howe G. Mg. Co	$¾	$¾
Bessmer Land.	$34½	$3 1¼
Bir. Mg.& Mg.	....	$83
Cahaba Coal Mg. Co	....	$70
Camille Gold Mg. Co	$½	....
De Bardeleben C. & I. Co	....	$76
Decat. L. Imp.	$14¼	$15½
DecaturMin.L.	....	$22¾
Ensley Land	$10	....
*Eureka	**$99½	....
Florence L. & Mg. Co	$20	$22
Gadsen Land	$6	$6¼
Hecla Coal Co.	$5	....
Hen. S. & M.Co	$75	$79
Mag-Ellen	$100	....
Mary Lee C. & R. Co	$20	....
Sheffield C. & Co	$58	$61
Sloss I. & S.	$44	....
†Sloss I. & S.	$94	$96
††Sloss I. & S.	....	$78
Tuscaloose C. I. & L. Co	$24	$27
Tenn.C. & I. Co. pref.	$100	$105
Woodstock I.Co.	....	$41

Prices, highest and lowest, bid and asked during week ending July 7.

* Bonds. † First mortgage. †† Second mortgage. ** Without interest.

Pittsburg, Pa.

COMPANY.	B.	A.	Closing
Allegheny Gas Co.	....	....	....
Bridgewater Gas Co.	$56.00	$61.00	$60.00
Chartiers Val. Gas	....	42.50	42.50
Columbia Oil Co.	2.00	2.75	2.13
Consolidated Gas Co.	....	....	....
East End E. Light Co.	60.00	....	60.00
East End Gas Co	....	....	....
Forest Oil	....	....	....
Hazlewood Oil Co.	....	....	....
La Noria Mining	.18	.20	.19
Luster Mg. Co.	17.88	20.00	19.75
Manuf'turers Gas Co.	14.50	16.50	15.00
Nat. Gas Co. of W. Va	....	....	....
N.Y.& Clev.Gas Coal.	31.50	....	31.50
Ohio Valley Gas.	10.50	26.00	10.75
Mansfield C. & C. Co.	....	....	....
Pennsylvania Gas	14.00	15.00	15.00
People's Natural Gas.	....	....	....
People's N. G. & P. Co.	15.50	16.25	16.25
Philadelphia Co.	30.88	31.25	31.00
Pine Run Gas Co.	....	....	....
Pittsburg Gas	....	....	....
Silverton Mg. Co.	....	....	....
South Side Gas.	....	....	....
Tuna Oil Co.	....	....	....
Union Gas.	....	....	....
Washington Oil Co.	90.00	....	90.00
W'house Brake Co.	....	....	....
W'house A. B. Co.	116.00	118.50	118.50
W'house E.Light.	36.00	38.88	36.38
W'moreland & Camb.	....	....	....
Wheeling Gas	18.63	20.00	19.75
Yankee Girl Mg	3.00	5.00	5.00

* Actual selling price.

Prices bid, asked and closing during the week ending July 19.

Sales during the week ending July 10:

Luster Mining	80 shs.	@$20
Philadelphia Co.	20 "	@$31½
West. Electric	65 "	$36½@$38½
Wheeling Gas	60 "	@$19½

St. Louis. July 9.

CLOSING PRICES.

COMPANY.	Bid.	Asked.
Adams, Colo.	$ .95	$1.10
American & Nettie	1.82½	1.90
Anderson	....	....
Aztec, N.Mex.	....	.25
Bi-Metallic	30 00	35.00
Black Oak, Cal.	....	....
Black Spar	....	....
Bremen	....	....
Buckskin	.13½	.15
Carriboo, Idaho	....	....
Central Silver	.15¼	.16¼
Cleveland, Colo.	.03	....
Cleveland, Idaho	.18¾	....
Cour d'Alene	....	.95
Dinero, Colo	....	....
Golden Era, Mont.	....	....
Golden King	....	....
Gold Run	....	....
Golden West	....	....
Granite Mountain, Mont.	45.00	46.00
Hope, Mont.	....	....
Ingram	....	.60
Iron Clad	....	.50
Ivanhoe, Colo	....	....
I. X. L., Colo.	....	....
Keystone	.01½	.02
La Union	.12	.13
Little Albert	.27½	.30
Little Giant	....	....
Major Budd, Mont.	.07	.08
Mexican Imp., Mex.	....	....
Michael Breen	1.25	1.27½
Montrose Placer, Colo.	....	....
Mountain Key	....	....
Mountain Lion	....	....
Neath, Colo.	....	....
Old Colony	....	....
Old Jesuit	....	....
Pat Murphy, Colo.	.12½	.14½
Pedro	....	....
Phillips, Colo.	....	....
Pine Grove, Idaho	....	.01
Queen of the West, Idaho	....	....
Raspberry, Mont.	....	....
San Francisco, Mont.	....	....
Silver Age, Colo.	1.50	1 65
Silver Bell	.06	.20
Small Hopes, Colo.	.92½	1.00
Tourtelotte, Colo.	....	....
West Granite, Mont.	1.00	1.10
Wire Patch	.15	.16¼
Yuma, Ariz.	.53¾	.55

Trust Stocks. July 11.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.	
Am. Cotton Oil. Tr. Repts.	$28⅝@$29
Cattle Trust	13 @ 15
Distillers' & Cattle Feeders'.	45¼@ 46
Linseed Oil	50½@ 52
National Lead	20¼@ 20⅝
Standard Oil	165 @169½
Sugar Refineries	76⅛@ 76⅞

Sales at the New York Stock Exchange week ending July 11:

	Sales.	Price— H.	L.
*American Cotton Oil	1,000	29¼	28½
National Lead	12,425	21⅜	20⅛
Sugar	41,248	76½	71⅛

* Trust receipts.

Foreign Quotations.

London.

COMPANY.	Highest.	Lowest.
Almada, Mex.	1s. 9d.	1s. 3d
Amador, Cal	£1 1-16	£ 5-16
Appalachian, N. C.	9d.	6d.
Canadian Phos. Canada.	£⅛	£⅛
Carlisle, N. Mex	3s. 6d.	3s.
Colorado, Colo.	4s.	3s.
Comstock, Utah	....	....
Condova	....	....
Cons. Esmeralda, Nev.	2s. 9d.	2s. 3d.
Denver Gold, Colo.	9d.	3d.
Dickens Custer, Idaho.	1s. 6d.	1s.
East Arevalo, Idaho.	2s.	1s.
Eberhardt, Nev.	....	....
El Callao, Venezuela	£2⅜	£2⅛
Elmore, Idaho	2s. 3d.	1s. 9d.
Empire, Mont	1s. 3d.	9d.
Garfield, Nev.	1s. 9d.	1s. 3d.
Jay Hawk Mont	3s.	2s.
Josephine, Cal	1s. 6d.	1s.
Kohinoor, Colo.	2s. 3d	1s. 9d.
La Luz, Mex.	9d.	3d.
La Valera, Mexico	1os.	10s.
Montana Lt., Mont	27s.	26s.
New California, Colo.	8s.	7s. 6d.
New Consolidated	9d.	3d.
New Eberhardt, Nev.	1s. 3d.	9d.
New Emma, S., Utah	1s. 6d.	1s.
New Flagstaff, Utah.	4s.	3s.
Newfoundland, N. F	3s. 6d.	2d.
N. Gold Hill, N. C.	1s 9d.	1s. 3d.
New Guston, Colo.	£5 15-16	£5 13-16
New Hoover Hill, N. C.	1s. 3d.	9d.
Old Lout, Colo.	⅛	⅛
Palmarejo, Mex	16s	15s
Pinos Altos, Mex	£⅝	£⅛
Pittsburg Cons., Nev.	£5-16	£¼
Richmond Con., Nev.	£1¼	£1
Ruby&Dunderberg, Nev	1s.	9d.
Sam Christan, N. C.	1s. 3d.	9d.
Sierra Buttes, Cal.	4s.	3s.
" Plumas Eur.	£15-16	£13-16
Sonora Mex	1s.	6d.
Stanly, N. C	....	....
United Mexican, Mex.	7s.	6s.
U. S. Placer, Colo.	2s. 3d.	1s. 9d.
Viola Lt., Idaho	2s.	1s. 6d.

Highest and lowest prices during the week ending June 28.

Paris.

	Francs.
Belmez, Spain	763.05
Callao, Venez.	62 50
Callao Bis, Venez.	6.50
East Oregon, Ore.	7.50
Forest Hill Divide, Cal	100.00
Golden River, Cal	450.00
" " parts	70.00
Lexington, Mont.	140.00
" parts	4.25
Ouray, Colo.	....
Rio Tinto, Spain	527.50
Tharsis, Spain	150.00

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, ℔ 100 lbs. $1.75@$2.00
Muriatic, 18°, ℔ 100 lbs 1.00@1.50
Muriatic, 20°, ℔ 100 lbs. 1.12½@1.75
Muriatic, 22° ℔ 100 lbs. 1.37½@2.00
Nitric, 36°, ℔ 100 lbs. 4.00@4.25
Nitric, 42°, ℔ 100 lbs. 6.00@6.25
Oxalic, ℔ 100 lbs. 6.50@10.50
Sulphuric, 60°, ℔ 100 lbs. 80@1.25
Sulphuric, 66°, ℔ 100 lbs. 1.00@1.75

Alkali—
Refined, 48 p. c. @2¾
Refined, 58°. 2¾@3

Alum—Lump, ℔ lb. 1¾
Ground, ℔ lb. 1¾@2
Lump ℔ ton, Liverpool. £4 17 6
Sulphate of Alumina, ℔ ton. £4 10

Aqua Ammonia—18°, ℔ lb. 4¾
20°, ℔ lb. 6
22°, ℔ lb. 6@7
26°, ℔ lb. 10@11

Ammonia—Sul., ℔ 100 lbs. 3.15
Carb., per lb. 7½@8¼

Arsenic—White, powdered, ℔ lb. 3¼@3½
Red. ℔ lb. 5¾@6¾
White, at Plymouth, ℔ ton. £12 2 6d.

Asbestos—Am., p. ton. $50@$300
Italian, p. ton, c. i. f. L'pool. £18@£60

Asphaltum—P. ton 13.00
Prime Cuban, ℔ lb. 4½@5½c
Hard Cuban, ℔ ton. $28.00
Trinidad, refined, ℔ ton. $30.00

Barytes—Sulph., Am. prime white 17@20
Sulph., foreign, floated, p. ton. 19½@21.50
Sulph., off color, p. ton 11.50@14.00
Carb., lump, f.o.b. L'pool, ton. £6
No. 1, casks, Runcorn " £4 10 0
No 2. bags, Runcorn " 3 15 0

Bleach—Over 35 p.c., ℔ lb. 2@2½

Borax—Refined, ℔ lb. 9½@9⅝
Concentrated. 7¾@8⅜
Refined at Liverpool, ℔ ton. £29

Brimstone—*See Sulphur.*

Bromine—℔ lb. 37@38

Chalk—℔ ton. 1.75
Precipitated, ℔ lb. 4¾@5

China Clay—English, ℔ ton 13.50@18.50
Southern, ℔ ton. 13.50

Chrome Yellow—℔ lb. 10@25

Cobalt—Oxide, ℔ lb. 2.60@2.90

Copper—Sulph. English Wks, ton £20@£21

Copperas—Common, ℔ 100 lbs. 70
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks. £1 15s.

Cream of Tartar—Am. 99% 22½
Powdered, 99 p. c. 23

Emery—Grain, ℔ lb. 4½@5
Flour, ℔ lb. 2¾@3½

Feldspar—Ground, ℔ ton. 15.00

Fuller's Earth—Lump, ℔ bbl. .90@95
Powdered, ℔ lb. 1¾@2

Gypsum—Calcined, ℔ bbl. 1.25@1.50

Iodine—Resublimed. 2.75

Kainit—℔ ton. $9.25@$9.75

Kaolin—*See China Clay.*

Lead—Red, ℔ lb. 6¾@9
White, American, in oil, ℔ lb. 6¾@7¼
White, English, ℔ lb. 8½@8¾
Acetate, or sugar of, white. 12@13

Lime Acetate—Amer. Brown. .95@1.00
Gray 1.75@1.87½

Litharge—Powdered, ℔ lb. 6½@6¾
English flake, ℔ lb. 9@9½

Magnesite—Greek, ℔ ton. 20.00

Manganese—Crude, per unit. 23@.28
Oxide, ground, per lb. 2½@6½

Mercuric-Chloride— (*Corrosive Sublimate*) ℔ lb. 70@72

Mineral Wool—℔ lb. 2

Mica—In sheets according to size, 1st quality, ℔ lb. .25@$6.00

Ochre—Yellow, "B. F.," ℔ ton, f.o.b. mill 30.00
"J. F. L. S.," ℔ lb. ex dock 2½

Phosphate Rock—S. Carolina, per ton f. o. b. Charleston. 5.75@7.00
Ground, ex vessel New York. 11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton. 16.00

Phosphorus—℔ lb. 70@75

Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7

Potassium—Cyanide, ℔ lb. .39@40
Bromide, ℔ lb. 33
Chlorate, ℔ lb. 13@10
Carb. ℔ lb. 4.70@5.54
Caustic, ℔ lb. 7½@8
Iodide. 2.65@2.70
Muriate, ℔ 100 lbs. 1.77½@1.80
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb. 10½@11
Sulphate, ℔ 100 lbs. 2.30@2.35
Yellow Prussiate, ℔ lb. 17½@18
Red Prussiate, ℔ lb. 42@45

Pumice Stone—Select lumps, lb. 3¼
Original cks., ℔ lb. 1¾@2
Powdered, pure, ℔ lb. 2¼@2¼

Pyrites—Non-cupreous, p. units 10d

Quartz—Ground, ℔ ton. 14.00@16.00

Rotten Stone—Powdered, ℔ lb. 3¼@3½
Lump, ℔ lb. 6@10

Salt—Liverpool, ground ℔ sack. 75@80
Turk's Island, ℔ bush. 25@28

Salt Cake—℔ lb. 60@62½

Saltpeter—Crude, ℔ lb. 5¼@5½
Refined, ℔ lb. 6@8

Soda Ash—Carb., 48 @ 100 ℔. 2¾
Caustic, 48 @ 2¼@2½
Soda Caustic, 60% 3.25@3.35
" 70% 3.00
" 74-76% 2¾
Sal, English, ℔ 100 lbs. 1½@1⅝
Sal, American, ℔ 100 lbs. .90
Nitrate, 100 lbs. 1.70

Strontium—Nitrate ℔ lb. 9@9¼

Sulphur—Roll, ℔ lb. 1¾
Flour, ℔ lb. 2
Crude Brimstone, 2s., ℔ ton. 19.00@19.29
Crude Brimstone, 3ds, ℔ ton. 18.50@18.70

Talc—Ground French, ℔ lb. 1¼@1½
Domestic, ℔ ton $18@$20
c. i. f. Liverpool, ℔ ton £4 5

Vermillion—American, ℔ lb. 61
English, ℔ lb. 82@85

Vitriol—(Blue), Ordinary, ℔ lb. 5½@5⅝
Extra, ℔ lb. 7

Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 6@6½
Paris, Red Seal, ℔ lb. 6¾@7
* Spot.

THE RARER METALS.

Aluminum—(Metallic), ℔ lb. $2.@$2.50
Sheet, per lb. 2.50

Arsenic—(Metallic), per lb. .40

Barium—(Metallic), per gram. $4.00

Bismuth—(Metallic), per lb. 2.75

Cadmium—(Metallic), per lb. 1.00

Calcium—(Metallic), per gram. 10.00

Cerium—(Metallic), per gram. 7.50

Chromium—(Metallic), per gram 1.00

Cobalt—(Metallic), per lb. 6.00

Didymium—(Metallic), per gram 9.00

Erbium—(Metallic), per gram. 7.50

Gallium—(Metallic), per gram. 140.00

Glucinum—(Metallic) per gram. 12.00

Indium—(Metallic), per gram. 9.00

Iridium—(Metallic), per oz. 7.00

Lanthanum—(Metallic), per gr. 10.00

Lithium—(Metallic), per gram. 10.00

Magnesium—Per lb. 4.50

Manganese—Metallic, per lb. 1.10
Chem. pure, per oz. 10.00

Molybdenum—(Metallic), per gm. .50

Niobium—(Metallic), per gram. 5.00

Osmium—(Metallic), per oz. 65.00

Palladium—(Metallic), per oz. 35.00

Platinum—(Metallic), per oz. 9.00

Potassium—Metallic, per lb. 28.00

Rhodium—(Metallic), per gram. 5.00

Ruthenium—(Metallic), per gm. 5.50

Rubidium—(Metallic), per gram 2.00

Selenium—(Metallic), per oz. 1.80

Sodium—(Metallic) per lb. 2.50

Strontium—(Metallic), per gm. .60

Tantallum—(Metallic) per gram 9.00

Telurium—(Metallic) per lb. 5.00

Thallium—(Metallic) per gram. .25

Titanium—(Metallic) per gram. 2.25

Thorium—(Metallic) per gram. 17.00

Tungsten—(Metallic) per oz. 2.25

Uranium—(Metallic), per lb. 5.00

Vanadium—(Metallic), per gm. 22.00

Yttrium—(Metallic), per gram. 9.00

Zirconium—(Metallic), per oz. 65.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000 3 50@3.75
Jerseys, ℔ 1,000 5.50@7.00
Up Rivers, ℔ 1000 6 75@7.00
Haverstraw seconds, ℔ 1000 6.50@7.00
Haverstraw firsts, ℔ 1,000 7.00@7.75
Fronts, nominal, ℔ 1000,
Croton 14.00@16.00
Wilmington 20.00@21.00
Philadelphia @22.00
Trenton @22.00
Baltimore

Building Stone—Amherst freestone, ℔ cu. ft. 95@1.00
Brownstone, ℔ cu. ft. 1.00@1.35
Granite, rough, ℔ cu. ft. .45@1.25
Granite, Scotch ℔ cu. ft. 1.00@1.15

Cement—Rosendale, ℔ bbl .85@1.10
Portland, American, ℔ bbl. 2.15@2.45
Portland, foreign, ℔ bbl. 2.30@2.40
Portland, " special brands. 2.45@2.75
Roman, ℔ bbl. 2.65@2.85
Keene's coarse, ℔ bbl. 4.50@5.50
Keene's fine, ℔ bbl. 7.00@8.25

Slate—Purple and green roofing, ℔ 100 ft. 7.00@7.50
Red roofing, ℔ 100 sq. ft. 12.00
Black, roofing, ℔ 100 sq. ft. 4.25@5.50

Lime—Rockland, common ℔ bbl. 1.00
Rockland, finishing, ℔ bbl. 1.20
St. John, com. and finish, ℔ bbl. .90@.95
Glens Falls, com. and fin., ℔ bbl .85@1.10

Labor—Ordinary, ℔ day 1.50@2.00
Masons, ℔ day 4.00
Plasterers, ℔ day 4.00
Carpenters, ℔ day 3.50
Plumbers, ℔ day 3.50
Painters, ℔ day 2.50@3.50
Stonesetters, ℔ day 3.50@4.00
Tilelayers, ℔ day 3.50@4.50
Bricklayers, ℔ day 4.00

THE ENGINEERING AND MINING JOURNAL will thank any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.